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SPINAL ANESTHESIA.*

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To justify this paper we will give briefly our experiences, the technique employed, and conclusions drawn from over fourteen hundred cases of spinal anaesthesia performed by Dr. George Mueller and myself in our clinics at St. Mary of Nazareth and Columbus Hospitals, and in the clinic of Professor Albert J. Ochsner at Augustana Hospital. Judging from our success, we do not hesitate to encourage others to employ this method in operations below the costal arch, with patients for whom a general anaesthesia is contra-indicated.

The history of spinal anaesthesia dates back to the discovery of cocain by Niemann in 1859. The discovery of the local anaesthetic properties of cocain, by Schraaf in 1862, was the second step in the development of this method. With the application of this discovery to surgical purposes, Dr. J. Leonard Corning, of New York, in 1885, employing cocain, experimented extensively and successfully with spinal anaesthesia. His method, notwithstanding his success, did not meet with general favor and was accordingly dropped until taken up some years later by Bier, of Kiel, in 1898. Bier also used cocain, practicing on himself, his assistant and six patients, producing anaesthesia up to the umbilicus in all his cases. In the *Deutsche Zeitschrift f. Chic.*, 1899, in which Bier's cases were reported, he urged great care in the use of this method on account of the dangerous effect of the drug. He accurately predicted, however, that the development of chemistry would produce a drug which could be used safely for spinal anaesthesia.

In 1905, at the German Surgical Congress, Bier called attention to the use of stovain, discovered by Fourneau in 1904, which, when used with one of the supra-renal preparations considerably lessened the danger attending its use. At this time, he expressed the opinion that spinal anaesthesia could be recommended for clinical use, although it had not yet been perfected.

Credit for the *first surgical operation* under spinal anaesthesia, in America, is given to Tait and Cagliere. Ostectomy of the tibia was successfully performed, with a three per cent solution of cocain, in a patient fifty-four years of age.

The distinction of *perfecting the technique* belongs to Jonnesco, and his report in 1908 to the Congress of the International Society of Surgeons in Brussels, popularized the method. Following this report, spinal anesthesia began to be used extensively. Unfortunately, there was a reaction, due entirely to the recklessness with which the method was employed, and the result was that when statistics were compiled, they showed that ether anaesthesia had a much greater range of safety.

Besides stovain, novocain, alypin and tropacocain were introduced, but novocain had been generally adopted in this country until its supply was shut off by the World War, when apothesin was manufactured and introduced by Parke, Davis & Company. It is our experience that both apothesin and novocain possess about the same advantages, excepting that apothesin is more toxic than novocain, which is offset by the smaller dose required and by its more lasting effect.

THE SAFETY OF SPINAL ANAESTHESIA DEPENDS UPON—

1. The purity and stability of the drug, as well as the dosage in individual cases.
2. The combined effects with the preliminary narcotic.
3. The site of puncture and method of injection.
4. A thorough knowledge of the drawbacks —their prevention and treatment.
5. The experience of the operator.

THE PURITY OF THE DRUG AND ITS LIABILITY TO DECOMPOSE.—We employ apothesin with adrenalin for the following reasons:

a. It is about six times less toxic than cocain when combined with adrenalin preparations.

b. Recovery from toxic doses is very prompt.

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c. It stands boiling without any perceptible loss of activity. Decomposition, if any, does not exceed one per cent of the amount of apothesin. No toxic products result from sterilization by boiling. The products of hydrolysis of apothesin are less toxic than the anaesthetic itself.

d. It is free from irritating action.

e. It is physiologically compatible with adrenalin preparations.

The last advantage is of great importance because—spinal anaesthesia causes a considerable fall in blood pressure, by cutting off nerve communication with the vasomotor center in the brain from a large vascular field, the splanchnic area and the lower extremities. (Crile-Anoci-Association, p. 126). This is prevented by the direct action of adrenalin on the muscle fibres in the vessel wall, independently of the vaso-motor system.

Adrenalin prevents too rapid absorption of apothesin into the circulation by contracting blood vessels in and about the nerve roots, thereby minimizing toxic symptoms.

Adrenalin also increases the anaesthetic potency of the drug, prolonging the anaesthetic period, thus increasing the efficiency of relatively small doses.

Apothesin and adrenalin are conveniently supplied in tablet form. Each tablet contains apothesin gr. 3/5, adrenalin gr. 1/1600.

For operations below the umbilicus, two tablets are dissolved in 3 c.c. of distilled water, making a two and two-thirds per cent solution. For operations above the umbilicus, three tablets are dissolved, making a four per cent solution.

The dosage is further regulated according to the condition of the patient. In debilitated subjects, in whom there is a low intraspinal pressure, ½ to 2/3 of the apothesin is injected, as the case may require, which I shall explain later. If this dosage is not sufficient to produce complete anaesthesia, a light ether anaesthesia will generally suffice.

These tablets can be relied upon in every respect with the exception of their sterility. Although apothesin has definite antiseptic action, killing the gonococcus in one, one and one-half, two per cent solution, or over (thereby lessening the danger of infecting the spinal sac with septic organisms), the manufacturers do not feel that it is sufficient to depend upon this for self-sterilization of the solution. Therefore, it is necessary to sterilize the solutions made from these tablets before use. Our solutions are prepared as follows:

An ordinary test tube and beaker are boiled for fifteen minutes in water free from bicarbonate of soda. We specify this because both apothesin and adrenalin are chemically affected by alkalies. For the same reason, we boil our needle, syringe, etc., in water free from bicarbonate of soda. Utensils and syringe are then carefully rinsed in freshly distilled water. We pour 3 c.c. of freshly distilled water (previously boiled for one-half hour or more) into the test tube, add the tablets and bring to a boil six to eight times to sterilize. We do not boil the solution continuously because adrenalin loses its effect by continuous boiling.

Only Clear and Colorless Solutions Should be Used.—If the solution is not perfectly clear, but cloudy, it has come in contact with alkalies. Change in color to a pinkish or brownish red is the result of decomposition of adrenalin by oxidation. This generally occurs when the tablets have been exposed too long to the air, or when the solution is prepared too long before use. Therefore, these tablets should be kept in air-tight containers, and the solution prepared just before operation. If these precautions are taken, the toxicity of the solution is lowered or entirely removed. The solution is poured into the beaker, from which it is drawn into the syringe. The specific gravity of our solution is approximately that of the spinal fluid; consequently, it is less likely to diffuse from the site of injection. Neither Babcock's lighter fluid, with alcohol, nor Barker's heavier solution, with glucose, has been tried.

The Combined Effects With the Preliminary Narcotic.—We recognize the advisability of employing a preliminary narcotic for the following reasons:

1. It produces a more profound anaesthesia with a smaller amount of apothesin—a decided advantage in acute inflammatory conditions of the abdomen where anaesthesia is harder to obtain on account of intense irritation of the nerves.

2. It brings the patient into the operating room without fear.

3. It prevents restlessness on the operating table, which is an advantage, as movements of the head induce nausea, vomiting, etc.

One hour before operation, one-sixth grain of morphine sulphate, dissolved in 2 c.c. of a twenty-five per cent magnesium sulphate solu-

tion is injected subcutaneously, and just before moving patient to the operating room another injection of the same solution is made, containing one-eighth grain morphine sulphate. But in debilitated subjects, one-sixth grain is generally sufficient and if, together with this, they have a low intraspinal pressure, the apothesin is reduced to one-half or two-thirds. The addition of magnesium sulphate produces a more complete relaxation, thereby lessening any resistance when the puncture is made, and in most cases the patient is free from pain from twelve to eighteen hours after operation. In other words, we have the principal advantages of scopolamin without its disadvantages; namely, stupor, respiratory embarrassment, cyanosis, and, several days after the operation, delirium.

Just before the operation, the patient is blindfolded and quietly moved to the operating room. He is placed on his right side, his back is asepticized with benzine, followed by four per cent tincture of iodine, which is washed off with ninety-five per cent alcohol. The field is protected by sterile towels. After observing strict aseptic precautions, we identify our landmarks by placing a towel from crest to crest of the ilium, which is on a line with the center of the body of the fourth lumbar vertebra, and inject the skin at the site of puncture with a two per cent solution of apothesin. An assistant lends aid by holding the patient's legs and head in such a way that the back is bent to increase the space between the lumbar spinal processes (the Katzen-Puckel of the Germans). The needle is introduced about one-half inch to the right side of the middle line and *not in the middle*, so as to avoid the extradural plexus of veins which are in the middle line. Enough cerebrospinal fluid is withdrawn to equal the amount of apothesin solution to be injected.

THE SITE OF PUNCTURE AND METHOD OF INJECTION.—The site of puncture depends upon the height of anaesthesia required. The most favorable site is in the lumbar region. The spinal column slants sacrally between the fourth and fifth, and, dorsally between the third and fourth, lumbar vertebrae; hence, when we require a low anaesthesia, we inject between the fourth and fifth; when a high, between the second and third, lumbar vertebrae.

The spinal cord ends at the lower border of the first lumbar vertebra; hence, to avoid injury to the cord we select a site below this point.

Between the first and second lumbar vertebrae, the cauda equina is arranged in right and left bundles, with a small space from two to three m.m. intervening. Unless you strike this intervening space, you will inject into the bundle of nerves on either side, when the patient will jerk his leg and complain of pain and you will be compelled to withdraw the needle.

Below the second lumbar vertebra the cauda equina is more evenly spread out, not in bundles. When the needle enters here, the nerve roots are generally pushed aside.

The height to which anaesthesia extends depends further upon the strength of the drug—more in high—and upon the amount of the solution—the greater the quantity, the higher the anaesthesia. We increase the quantity of our solution by withdrawing and mixing sufficient cerebrospinal fluid to equal the amount required, as follows:

For perineum, external genitals, and lower extremities, 3 c.c. of a two and two-third per cent solution is injected between the fourth and fifth lumbar vertebrae, without the addition of cerebrospinal fluid.

For operations below the umbilicus, a 3 c.c. of a two and two-third per cent solution, plus 4 c.c. of spinal fluid, is injected between the second and third lumbar vertebrae. This brings our solution high enough to anaesthetize the tenth intercostal, which innervates the peritoneum immediately above the umbilicus; the eleventh, immediately below the umbilicus; and lower down, the eleventh and twelfth intercostal nerves.

For high abdominal operations, we use 3 c.c. of a four per cent solution, plus 7 c.c. of spinal fluid, and inject between the second and third lumbar vertebrae. This brings our solution high enough to anaesthetize the seventh, eighth and ninth intercostal nerves, which innervate the peritoneum of the epigastric and mesogastric regions.

The needle is withdrawn with a quick jerk and the puncture sealed. As soon as the injection is completed, we place the patient on his back with a pillow under his head, to prevent bulbar complications. In about ten minutes the greater part of the anaesthetic solution is absorbed by the nerve roots reached by our injection. It is perfectly safe to place the patient in the Trendelenburg position after this time. The unabsorbed solution, after ten

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minutes, is too weak to produce anaesthesia by diffusion higher up (Labat).

A Thorough Knowledge of the Drawbacks, Their Prevention and Treatment.—As the principal drawbacks to spinal anaesthesia are circulatory and respiratory depression, we anticipate these as follows:

1. By employing adrenalin with the apothesin.
2. By injecting subcutaneously caffeine citrate, grs. 3, one and one-half hours before operation; and one grain just before the anaesthetic is administered, the latter dose being repeated every hour for six hours after the operation.
3. By administering the anaesthetic in the lateral instead of the sitting posture.
4. By injecting the anaesthetic solution slowly.
5. By keeping the patient talking and taking deep breaths.

By Employing Adrenalin with the Apothesin.—As before stated, adrenalin prevents too rapid absorption of apothesin into the circulation by contracting blood vessels in and about the nerve roots, thereby lessening toxic symptoms.

By Administering Caffeine Citrate, grs. 3, one and one-half hours before the operation, we are certain of its maximum of stimulation, which begins from forty-five to ninety minutes after it is administered.

Caffeine citrate stimulates the whole nervous system, the brain, medulla, and spinal cord.

By its action on the brain it stimulates psychic function. It produces a sense of wakefulness and counteracts the drowsiness produced by the morphine sulphate solution given as a preliminary narcotic, a decided advantage when the patient's co-operation is necessary to combat symptoms of circulatory and respiratory depression.

By its action on the medullary centers, vaso-constriction takes place, and respiration is stimulated; both number and depth of respirations are increased; hence, respiratory depression is eliminated or greatly diminished.

Caffeine citrate also stimulates all muscle fibres—striped, plain, and cardiac; and, as a result of its direct action on the vessel wall, vaso-constriction is further aided which, together with its stimulating action on the heart muscle, increases the blood pressure, eliminating or lessening nausea and vomiting.

By Administering the Anaesthetic in the Lateral Instead of the sitting posture, the immediate accidents, such as pallor, headache, and syncope are prevented These are never dangerous, pass off quickly when the patient is placed in the recumbent position, but should be avoided as they may induce an unsuccessful anaesthesia in a nervous patient.

By Injecting Our Anaesthetic Solution Slowly.—The slower the injection, the slower the absorption, as the toxicity of the solution varies with the velocity of the injection. Furthermore, a rapid injection increases the height of anaesthesia, which has already been provided for by the dosage and quantity of our solution.

By Keeping the Patient Talking and Taking Deep Breaths.—A competent nurse should be in charge of the patient, to keep him answering questions and occasionally taking a deep breath to keep the brain active and to stimulate the respiratory centers. As long as he is able to do this he is a safe patient.

During the operation (generally ten or fifteen minutes after the spinal injection is made), some patients show signs of nausea and vomiting. This is due to anaemia of the brain, resulting from poor blood pressure. Even with all possible precaution a sudden drop in blood pressure may occur. This condition quickly subsides when the patient is placed in the Trendelenburg position. If, however, this is accompanied by respiratory depression, it is due to an overdose or too rapid absorption of the drug, and artificial respiration should be resorted to until natural respiration has been re-established. If this is not effective, the patient should be turned on his side, lumbar puncture performed, and five grs. of caffeine citrate injected into the cerebro-spinal fluid, after which the patient is again placed on his back in the Trendelenburg position and artificial respiration continued. We have never had to resort to this treatment, but it has given good results in the hands of Dr. Francisco Najera, of Mexico City, who has used cocain in over 5,000 cases of spinal anaesthesia without a direct mortality. Doctors A. J. Ochsner, William Mayo and I witnessed several successful operations under this anaesthetic at the Military Hospital in Mexico City—one above the costal arch for abscess of the lung.

Experience of the Operator.—All things considered, the safety of spinal anaesthesia is a matter of the personal equipment in knowl-

edge and technique upon the part of the operator and his ability to recognize and meet complications.

Apparatus

Our apparatus consists of a glass record-syringe, graduated to 15 c.c. and a needle of 10-karat gold. This needle has the advantage of being non-corrosive, is flexible and capable of prolonged boiling. The needle is five inches long, one-sixteenth of an inch in diameter, and holds a stylet to prevent clogging when introduced.

The point of the needle is not too sharp nor too dull. If the point is too sharp, you will pierce the structures without recognizing the resistance offered by the ligamentum subflavum, after piercing which the stylet should be withdrawn and the needle advanced cautiously—a little at a time—until it enters the sac.

If the point is too dull, it will push the dura in front of it, causing the so-called "dry tap" or failure.

The bevel of the needle is short. If the bevel is too long it may only partially enter the sac, spinal fluid will escape, leaving you to think the needle is within the sac; but when the anaesthetic solution is injected most of it escapes extradurally, again causing failure or partial failure. If a long-bevel needle is introduced far enough to overcome this objection, at the site where we inject, it may injure the cauda equina; or if the injection is made higher than the site we advocate in this paper, it may result in injury to the spinal cord.

The toxic symptoms as observed by us—such as nausea, vomiting, faintness, dyspnea, rapid, feeble pulse, pallor, etc., when we used novocain, were due to decomposition of the adrenalin, allowing too rapid absorption of the anaesthetic solution into the circulation, and not to its action upon the higher centers by diffusion. Clear solutions, with the same technique, did not produce these symptoms. Hatcher and Eggleston have shown that slow and continuous intravenous injections of novocain fail to produce lasting effects, even though the total amount was ten times as great as that required by rapid injection to cause death. In a patient with a good heart the dose we employ would have no further effect than to cause these toxic symptoms, which disappear promptly by placing them in the Trendelenburg position, instituting artificial respiration, and injecting subcutaneously three grains of caffeine citrate, if this has not been done. In patients, however, who suffer with poorly compensated valvular lesions, and who have no reserve fund of cardiac strength to draw upon, death may be the result. The only death we have charged to direct mortality was due to decomposition of the adrenalin. This was in a patient sixty-five years of age, with a poor heart.

The after effects of spinal anaesthesia are few and consist chiefly of headaches, incontinence of urine, and partial paralysis of the sphincter ani. These annoyances last from three to five days and require no special treatment. Nausea and vomiting occurred in less than one per cent of our cases and was not accompanied by constant retching and straining. Persisting headaches, paraplegia and medullary lesions, which are attributed to spinal anaesthesia, may be due to syphilis or to faulty technique.

There is a marked and favorable contrast in the condition of spinal anaesthetic patients as compared with general anaesthetic patients; this has been observed and fully commented upon by fellow-patients, nurses, attendants and visitors. The patients usually return from the operating room conversing about the wonders of their own operation, or soon fall asleep and awaken actually refreshed. Inhalation pneumonia from aspiration of mucus and ether is eliminated.

We have classified our operations into four groups and thus give a fair presentation of what we consider indications for its use:

Group 1. This is the largest group and consists of over nine hundred cases in which the wisdom of using a general anaesthetic had to be carefully debated because of heart, lung, kidney, or liver conditions. The heart lesions included valvular disease with poor or broken compensation, myocarditis from the toxines of alcohol, previous acute infectious disease, thyroidal hyper-secretions, and obesity. Lung and bronchial lesions included pneumonia, bronchitis, and asthma. Liver diseases were chiefly limited to cirrhosis and gall-bladder affections. Among the renal lesions were included acute, chronic and mixed nephritides. In an article by Salvador Pascual, of Madrid, on Renal Physiology and Spinal Anaesthesia, he says:

"In principle, all general anaesthesia is dangerous because of the intoxication it produces in the organism. This is of great importance

in patients who have in greater or less degree, lesions of the kidney, an organ of elimination, and of the liver, a defense against intoxication. The oliguria following general anaesthesia lasts three to six days. It may be due either to direct action of the anaesthetic or to that deprivation of food and drink that the patient suffers after the narcosis. To this oliguria is largely due the increase of concentration of all substances dissolved in the urine. In eliminating less water the kidney is obliged to concentrate its elements. But a kidney that was already working with maximum concentration cannot increase this concentration in order to eliminate the urea and is compelled to retain the urea, with possible fatal result. This is the mechanism by which an appreciable number of renal patients die profoundly infected from four to six days after operation. The author has never had any untoward results from spinal anaesthesia."

The occurrence of oliguria after ether anesthesia and its absence after spinal anaesthesia is very noticeable even to the nurses in our complete hysterectomies, in which cases we make it a practice to insert a retention catheter. The patient who has received a general anaesthetic with a normal kidney eliminates only a few ounces of urine the first twenty-four hours; whereas, the other, with a diseased kidney, who received a spinal anaesthetic, eliminates a much greater amount of urine.

The operations in this group represented appendectomies, cholecystectomies, gastro-enterostomies, ovarian cysts, Caesarean section, tuberculous and septic peritonitis, nephrectomies, herniotomies, Lane-plate and autogenous bone work on the lower extremities.

Group 2. This group consisted of over four hundred cases in which the prevention of surgical shock was a serious problem, as an intestinal resection for strangulated hernia in old people; thigh and leg amputation for senile and diabetic gangrene; prostatectomies; extirpation of rectal carcinoma; and abdominal gunshot and stab wounds.

Anoci-association is obtained by spinal anaesthesia. It causes a complete nerve-block, by blocking the transmission of impulses from the periphery to the brain, preventing surgical shock. It is the emergency method in these cases.

In diabetic cases we find that after a short preliminary treatment the patients are fair risks for spinal anaesthesia. Even those not in favor of its use prefer spinal anaesthesia to general anaesthesia in these cases.

I well remember the beginning of spinal anaesthesia in Professor Ochsner's clinic at Augustana Hospital. During the World War it was my great privilege to work with and assist Professor Ochsner. We had been administering spinal anaesthesia for a number of years at St. Mary of Nazareth Hospital, Chicago, but Professor Ochsner did not take to the method, and I was greatly surprised when I was asked to give a spinal anaesthesia to a feeble old lady, suffering with senile gangrene of the left leg. The operation was performed near the noon hour and while Professor Ochsner was closing the wound, this dear old lady said: "I wish you would hurry Dr. Ochsner, I am very hungry and afraid I will miss my dinner." We gave quite a number of spinal anaethesias in Professor Ochsner's clinic after that in urgency surgery of the aged, especially physicians, and I am happy to say—successfully.

Group 3. This group consisted of over seventy-five cases and represented border-line cases which were not seriously enough involved to be included in either of the above groups, and could have taken ether if administered by an expert anaesthetist.

Group 4. This is the smallest group and consisted of only twenty-one cases. The patients in this group displayed dangerous symptoms while taking a previous general anaesthetic.

We have observed in our abdominal work that the anaesthesia sets in later in the parietal peritoneum than in the skin, muscles, fascia, etc., thereby causing a little delay. Permit me to emphasize here that any undue haste or rough manipulation will completely upset the entire anaesthesia. A few minutes of waiting, with a little re-assurance to the patient, who has felt the pain of the knife, careful manipulation of the peritoneum and viscera, and the anaesthesia will prove to be perfect.

As a general rule, relaxation is more complete in spinal anaesthesia, the abdominal wall is paralyzed and softened, and the intestines are contracted, which makes it invaluable in intestinal obstruction. A larger field of operation is the result, fewer laparotomy pads are required and the operation is thereby more readily performed. There is also less difficulty in closing the abdomen.

Occasionally, in operations requiring a great

deal of time, the anaesthesia does not last throughout the entire operation. In such cases ether is given to supplement it, which is generally for a very short period.

We have observed a few cases in which the anaesthesia was apparently complete, but traction on the parietal peritoneum, as occurs in posterior gastro-enterostomies and intestinal resections, causes pain; ether is given while traction is being made, but none during the remainder of the operation.

Failures are due to unstable drugs, improper needles, slipping of needle out of sac, and faulty technique.

CONTRA-INDICATIONS: Blood pressure below 90; all operations above the costal arch; all operations requiring only a light anaesthesia; young, robust individuals; syphilis; superficial infections at or near the site of injection. If unable to vouch for the purity of the drug or the asepsis, and thorough cleanliness of the apparatus, or the technique of the operator, spinal anaesthesia is surely contra-indicated.

In analyzing spinal anaesthesia we have come to the following conclusions:

1. Spinal anaesthesia is of distinct value for patients for whom inhalation anaesthesia is contra-indicated or local anaesthesia is impracticable, in operation below the costal arch.

2. It is best tolerated when most needed—in old people—due to slow absorption of the drug.

3. For feeble, old individuals, it is not necessary to employ the full strength of dose, as for the vigorous.

4. Spinal anaesthesia, when properly given, causes no more discomfort than a hypodermic injection; whereas, nothing is more discomforting than going to sleep with, and recovering consciousness from, a general anaesthesia.

5. Control is exercised by the site and velocity of injections, the proper dosage, the addition of adrenalin, the specific gravity and the quantity of the solution.

6. No preliminary preparations are necessary. Fluids may be taken up to, and right after, operation, which is a decided advantage in renal cases and in the debilitated and weakened from any cause, when maintaining nutrition is of vital importance.

7. A strong recommendation is that by spinal anaesthesia, anoci-association is obtained and operations causing much shock can be more successfully performed.

8. In renal, hepatic and septic cases there is not the added strain of ether elimination to overwhelm the patient.

9. Makes better surgeons, careful manipulations and avoidance of traction being necessary; hence, traumatism is lessened.

10. Ideal in emergency cases.

11. Complete relaxation of the striated muscles and contractions of the smooth muscles are obtained, a decided advantage in intestinal operations.

12. Operating time is shortened; more being possible through a small incision because of a more complete relaxation.

13. There is lessened hemorrhage; this fact is very noticeable.

14. Post-operative retching and straining, nephritis, and inhalation pneumonia do not occur.

15. In a small number of cases we are compelled to give ether, but even in those cases it is very efficient with a small amount of ether and the relaxation is more complete than with a general anaesthesia.

16. Spinal anaesthesia is not a surgical novelty, neither is it on trial, for it has proven its worth and has come to stay. It should be taught and every clinic should be prepared to administer same. Failures diminish with experience.

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209 *South State Street.*

FREQUENCY OF URINATION.*

By AUSTIN I. DODSON, M. D., Richmond, Va., Attending Urologist, St. Elizabeth's Hospital.

There is no one symptom of disease that causes more distress to the patient and is more frequently misunderstood by the physician than frequency of urination. It happens, therefore, that urinary antiseptics and sedatives often become the treatment of a symptom while some disease of the urinary tract or associated organs goes unrecognized and untreated. The fact that practically all diseases of the urinary tract produce some frequency of voiding demands that we confine our attention to those conditions in which irritability of the bladder is the most pronounced symptom, especially those conditions without characteristic pain or evidence of pathology in the urine. It is in such cases that the cause for frequent urination is apt to be overlooked unless a careful cystoscopic study is made.

An application of the knowledge that frequency of voiding, either with or without pain, is often a symptom of diseases of the ureters and urethra, and that lesions may exist in the bladder without pus or blood in the urine, would go far to curb empiricism in the treatment of irritable bladders. If we could realize that cystitis with few exceptions is a secondary process, the result of some obstructive lesion, or of infection primary in the kidney, we would not continue to use only antiseptics and irrigations but would locate and treat the cause.

A small number of these irritable bladders are due to reflex irritation from pelvic disease, such as small tumors, malposition of the uterus, or tubal inflammation. Diseases of the anus and rectum also occasionally cause bladder irritation, but these same conditions so frequently exist without bladder disturbance that they should never be set down as the causative agent until a thorough study of the urological organs has eliminated local disease.

I wish particularly to call attention to localized panmural cystitis or Hunner's elusive ulcer. The lesion occurs in the mobile part of the bladder, usually high in the vertex, causing constant discomfort to the patient but usually with no alteration in the character of the urine. The ulcer is insignificant in appearance and easily overlooked if the possibility of the condition is not borne in mind. Through the cystoscope the lesion appears as an erythematous patch, usually sharply marked, but in some cases shading off into the normal mucous membrane (Fig. 1). In the center of the area there usually appears one or more superficial ulcerations. Hunner states that he has never seen them covered with necrotic material or urinary salts, and has never seen any suggestion of malignancy—although in some instances the disease has persisted for years.

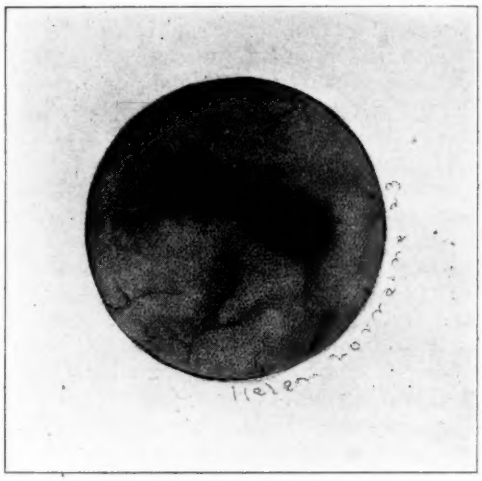

Fig. 1.—Cystoscopic view of Hunner's ulcer. In this case there were two sharply marked erythematous areas about an inch apart.

At operation the ulcer appears much more clearly defined than when seen through the cystoscope. The entire bladder wall is involved, and the location of the ulcer can often be determined before the bladder is opened by thickening of the bladder wall and adhesions

*Read at the fifty-fifth annual meeting of the Medical Society of Virginia, in Staunton, October 14-17, 1924.

to the prevesical tissues. When the bladder is opened the ulcer appears as a sharply circumscribed, deeply congested area, often covered with fibrin deposits and coagulated blood (Fig. 2). Under the microscope it presents the picture of an inflammatory process of long standing. The ulcer-bearing area shows an incomplete loss of epithelium, the principal lesion being sub-epithelial. In the sub-mucosa

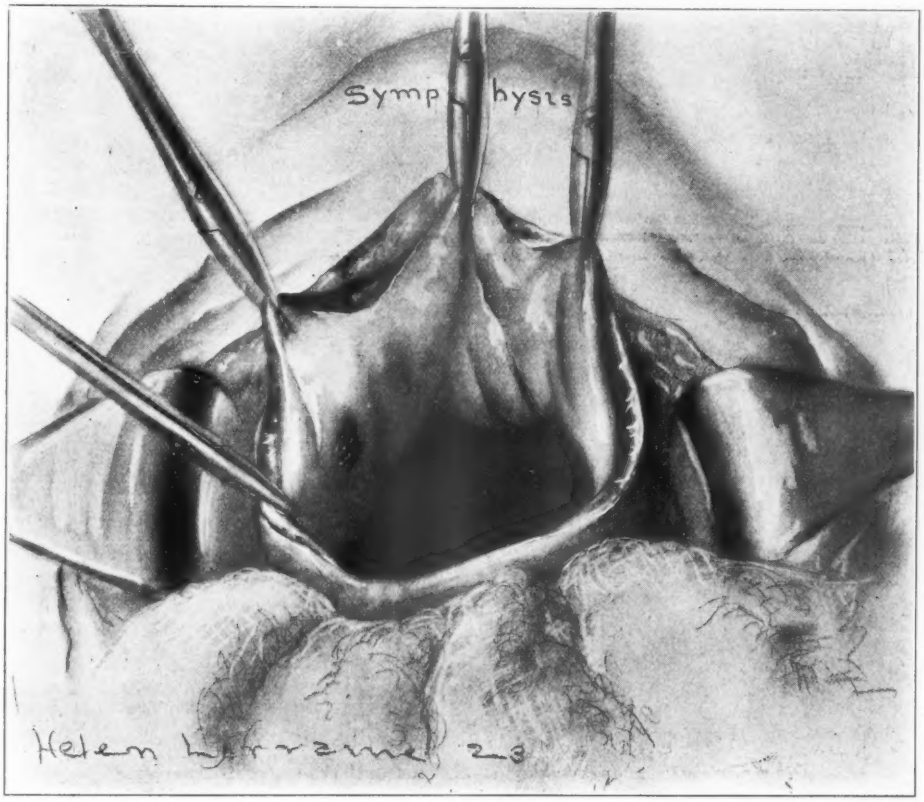

Fig. 2.—Bladder, opened suprapubically, showing two clearly defined ulcers on the anterior wall of the bladder.

are newly formed blood vessels packed with red blood cells. Round cell infiltration interspersed with newly formed connective tissue cells is seen throughout the sub-mucosa and in places extending into the muscular layer.

The urine is practically always sterile and there is very rarely any chemical or microscopical change except, in some instances, an occasional red blood cell or leucocyte. Hunner is inclined to think that the condition has some relation to foci of infection. This opinion seems to be borne out by the experimental work of Meisser and Bumpas, of the Mayo Clinic, who injected cultures of organisms obtained from the teeth and tonsils of patients suffering with ulcers of the bladder into the blood streams of nineteen rabbits and recovered them from the urological tract of sixteen, thirteen of which had lesions of the urinary bladder.

Of four patients whom I have treated for elusive ulcer of the bladder, three had had previous operations on the pelvic organs with the hope of relieving irritable bladders. Three of these four patients are now well, two following resection of the diseased portion of the bladder, and the other following fulguration and instillations of silver nitrate. One patient with a very large ulcer who has refused operation, is improving with instillations of silver nitrate. It is important in the treatment of these cases to eradicate every possible focus of infection.

Case Reports

Mrs. F. B. S., aged forty-eight, was admitted to St. Elizabeth's Hospital, March 12, 1923, complaining of constant desire to void and burning and aching in the bladder. About ten years ago the patient noticed that she was voiding more frequently, and that there was in the region of the bladder some slight pain which was constant, with no relation to urination. Both pain and frequency gradually became worse until the patient had very little control over the bladder.

About six years ago she had an anterior suspension of the uterus, which gave some relief for several months, when the discomfort returned as before. Two years ago she had an operation on the bladder, the nature of which she does not know. Since the operation her symptoms have been worse. Two weeks before entering the hospital the pain became much worse as a constant dull ache in the region of the bladder and burning in the urethra during and following urination. At the time of entering the hospital the patient was almost incontinent, voiding about every ten or fifteen minutes. There was no history of pyuria or hematuria.

The patient has had two children—the first still-born and the other living and well. She had the usual diseases of childhood, and influenza in 1919. She has suffered for the past ten or fifteen years with occasional headaches and a mild bronchitis.

Physical examination showed a well developed and well nourished woman. Several teeth were missing and there was evidence of considerable dental work on those remaining, which seemed to be in fairly good condition. Otherwise, the physical examination was negative.

The blood pressure was 140 systolic and 80 diastolic. The Wassermann was negative. The blood count was normal. The urine contained a trace of albumin and a few leucocytes.

Cystoscopic Examination: The bladder would only hold about four ounces of urine, which caused considerable discomfort. The bladder mucosa seemed practically normal at the base. Both ureteral orifices appeared normal. There was some congestion near the trigone. High up in the anterior wall of the bladder near the vertex and slightly to the left of the midline was a small deeply congested area about one-quarter inch in diameter. An inch from this and to the left was another similar area with a small streak of mucus extending downward and backward. These areas were fairly sharply marked. The bladder mucosa in this region appeared practically normal. (Fig. 1).

The patient was operated upon March 13th under gas and ether anesthesia. An incision was made from the pubis to about half-way to the umbilicus. The scar of the previous operation was excised and the incision extended downward toward the bladder. Previous pelvic operations caused the operation to be very difficult, as considerable scar tissue had to be gone through before the bladder was reached. The anterior and superior walls of the bladder were dissected free from the surrounding tissues. While dissecting the scar tissue away from the vertex of the bladder, a small opening was made in the bladder. This opening was enlarged transversely and the bladder held open, showing two small ulcers on the upper anterior wall of the bladder about one inch apart (Fig. 2). This portion of the bladder wall including the two ulcers was excised with scissors. The bladder was closed with two layers of 00 tanned catgut. Two cigarette drains were carried down on each side of the bladder, and the abdominal wound was closed with interrupted sutures of silk-worm-gut. An in-dwelling catheter was left in the urethra for drainage and immobilization.

The specimen consisted of a portion of the bladder wall about one and one-half inches by one inch. This included the two ulcers about an inch apart, each about one-eighth of an inch in diameter.

The patient made an uneventful recovery and when leaving the hospital could retain three ounces of urine without discomfort. She is now entirely well.

Another interesting case of bladder ulcer is Mrs. J. S. S., age forty, who consulted me on May 3, 1923, complaining of discomfort in the region of the pelvis and frequency of urination. The urine contained a number of leucocytes and a small amount of albumin.

Cystoscopic examination showed bladder mucosa to be entirely normal with the exception of congestion of the internal sphincter, the trigone, and the region of the left ureteral orifice. There were two orifices on the left side, one normal in position and in appearance. Just below and to the mid-line of this, the ureteral papilla projected out in a little mound, on the side of which there was a small ulcera-

tion and considerable edema and congestion. At the lower extremity of the papilla there was a small pin-point opening which proved to be an accessory ureteral orifice (Fig. 3). Indigo carmin given intravenously appeared in five minutes from the right ureteral orifice and from the normal left ureteral orifice. About two minutes later a small jet of dye came from the accessory opening. Just before the jet of urine appeared, the area around the opening was seen to balloon out, showing that there was obstruction to the outflow. The small

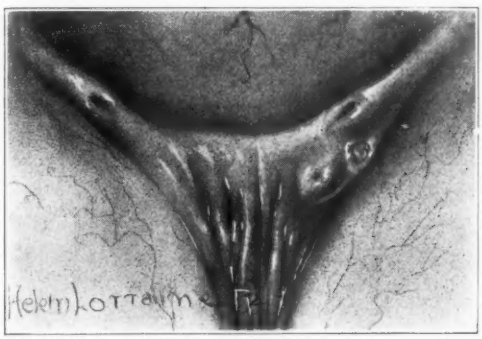

Fig. 3.—Simple ulcer of the bladder proximal to a stenosed accessory ureteral orifice. The ulcer healed spontaneously, following dilatation of the orifice.

orifice was catheterized with a number 4 filiform and bougies were inserted, gradually increasing the size to number 6. The pelves of the three ureters were irrigated with one per cent mercurochrome. The patient was seen at intervals of two weeks for three months and the kidney pelves were irrigated and the accessory ureter was gradually dilated up to number 11 French. At this time the patient was feeling very much better and the ulcer at the side of the ureteral orifice was entirely well.

An interesting feature of this case is the fact that the ulcer healed promptly when put at rest by dilating the stenosed ureteral orifice.

Chronic urethritis is a frequent cause of bladder irritation in women, the urine often being entirely negative, although usually there are a few leucocytes. On examination there may be no external evidence of disease, or the mucous membrane may protrude in redundant folds, congested, and tender to touch (Fig. 4). In passing a sound or speculum, there is marked tenderness and more resistance to the passage of the instrument than is noticed in the normal urethra. The mucous membrane, deeply congested, pouts into the end of the speculum and bleeds easily. The inflammatory process may extend into the trigone, giving it a granular appearance with congestion and distention of the blood vessels (Fig. 5). There may be bullous edema of the trigone, and occasionally small translucent vesicles situated along the blood vessels over the entire bladder surface—a vesicular cystitis.

Some of these cases respond readily to applications of ten per cent silver nitrate to the trigone and urethra; others clear up only after focal infections have been eliminated.

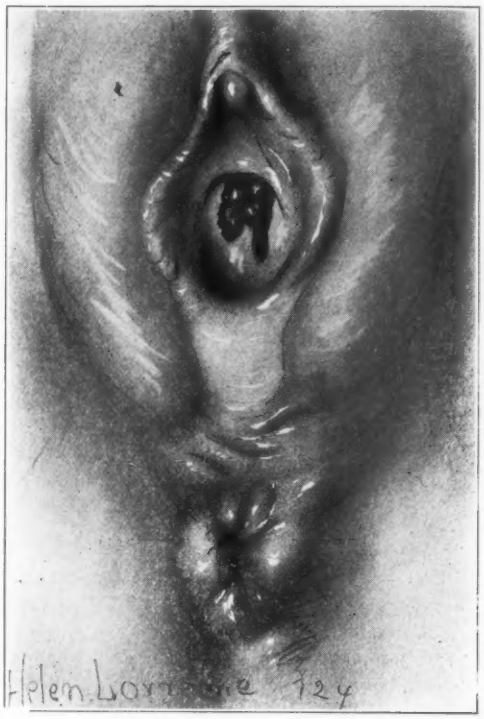

Fig. 4.—Protrusion of the mucous membrane in chronic urethritis.

Case Reports

Mrs. J. B., age fifty, consulted me November 9, 1923, complaining of marked frequency of urination existing over a period of five or six years. There was also slight discomfort in the region of the bladder when the patient was on her feet. The urine contained a few red blood cells and an occasional leucocyte. The mucosa of the urethra protruded slightly and was pale and granular in appearance. There was a sense of resistance in the urethra as the cystoscope passed. Cystoscopic examination showed the bladder mucosa normal throughout,

with the exception of the trigone, which was studded with minute granulations. The blood vessels of the trigone stood out more prominently than iormal (Fig. 5). Both ureteral

Fig. 5—Chronic trigonitis. Note the coarse granular appearance and dilated blood vessels.

orifices appeared normal and the kidney function was normal. Specimens of urine from both kidneys were normal. The trigone and urethra were painted with ten per cent silver nitrate.

General examination showed the patient to have several bad teeth with some pyorrhea. Following the extraction of these teeth, her bladder symptoms were very much worse for a few days, after which she began to improve. The patient was given daily instillations of ten per cent argyrol until December 15th, when examination showed very marked improvement in the appearance of trigone and urethra, and the patient expressed herself as feeling better than she had for several years. When heard from six months later, she was very much improved.

Another interesting case is Mrs. W. D. T., age sixty, who came September 25, 1924, complaining of frequency and burning on urination for the past six months. The patient has had infected teeth and tonsils removed, and has had an operation for suspension of the uterus and repair of the perineum; otherwise, the past history is uninteresting. Six months ago she began to have trouble with her bladder, getting up several times at night to void and experiencing considerable pain during the act. At two different times during this period she has been confined to the bed and treated with bladder irrigations and sedatives. There was at first considerable pus in the urine, which had practically cleared up. There was no relief of the bladder discomfort.

Examination showed the mucosa of the urethra to be protruding, very deeply congested and somewhat granular (Fig. 4). There was considerable pain on passing the cystoscope. The bladder capacity was normal and the mucosa mildly congested throughout. The blood vessels were a little more prominent than normal, especially over the trigone. Situated along the course of the blood vessels, but apparently not directly connected with them, were many vesicles about the size of small shot, some single, others in clusters of three or four. Those on the trigone and around the internal sphincter were larger, giving more the appearance of bullous edema. The urine contained an occasional leucocyte. Both ureteral orifices were normal in appearance, and indigo carmin given intravenously appeared from both kidneys in about six minutes.

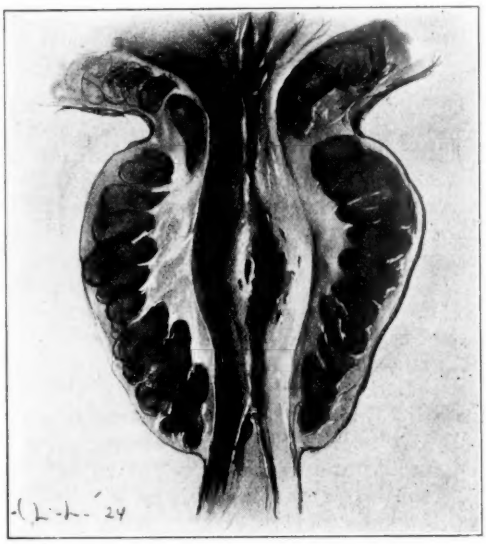

Fig. 6.—The floor of the posterior urethra showing openings of ducts from the prostate and seminal vesicles.

The redundant mucosa was removed with the electric cautery and ten per cent silver nitrate applied to the trigone and urethra. Three weeks following this treatment the patient showed considerable improvement, the bladder holding eight ounces without discomfort, and

the patient having to void only twice during the night.

In the male, chronic inflammation of the verumontanum causes marked frequency of urination, often accompanied by intense pain. The condition is usually the result of infection in the prostate and seminal vesicles. Being constantly bathed by the secretions of these organs the posterior urethra cannot escape contamination when they become infected (Fig. 6). The urine is often entirely negative.

The verumontanum is congested and granular and often enlarged.

When the prostate and vesicles are massaged, the secretion contains pus in varying amounts, sometimes with complete absence of normal prostatic contents. Complete relief is given these patients by applying twenty per cent silver nitrate to the verumontanum and massaging the prostate and vesicles.

Frequency of urination is the earliest and most constant symptom of prostatic hypertrophy. It makes its appearance when there are only a few cubic centimeters of residual urine, and persists until retention demands relief.

The greatest need in prostatic surgery is early recogition of the disease. It is unreasonable to expect further reduction in the morbidity and mortality of prostatic cases until we have learned to recognize the early signs of the disease and institute treatment before the patient's health has been broken by the inroads of back pressure and infection.

Case Reports

Mr. R. B. M., age fifty-six, was admitted to St. Elizabeth's Hospital, July 10, 1924, complaining of painful and frequent urination existing over a period of two years. In the last few months there had been some slight difficulty in starting the stream. The urine contained a trace of albumin and an occasional leucocyte.

Cystoscopic examination showed the bladder mucosa to be deeply congested throughout and the inter-ureteral ridge slightly more pronounced than normal. Both ureteral orifices were normal in appearance. The bladder was moderately trabeculated, and there were three small shallow saccules on the right lateral wall of the bladder, and one just behind the left ureteral orifice. The prostate was moderately enlarged. The posterior lobe, about the size of the thumb, projected into the bladder; the lateral lobes, slightly enlarged, met the posterior lobe at an angle on either side. There was apparently no encroachment on the posterior urethra. The patient had a residual urine of three ounces.

The prostate was removed through a suprapubic incision. The patient made an uneventful recovery and left the hospital well on August 13th.

The character of a symptom is rarely an index of the seriousness of the disease. The pain and bladder spasm resulting from stone in the bladder does not differ from that caused by carcinoma of the bladder. A patient recently treated for infection of the verumontanum and prostate, sent his neighbor complaining of the same symptoms. The neighbor was suffering with a large infected hydronephrosis with secondary infection of the bladder. He had no inconvenience from the hydronephrosis until his bladder became infected. The same symptoms led to the discovery of a relatively mild condition in one and a destroyed kidney in the other. The palliation of symptoms with sedatives and irrigations may, on the one hand, merely result in unnecessary suffering and a delay in cure, while, on the other, it may permit the destruction of an organ and imperil the patient's life.

Frequency of urination is more than a symptom of some disease of the genito-urinary system. It is a signal of danger, may be slight, may be grave, but demanding a thorough investigation before treatment is instituted. Only in this way can we obviate unnecessary suffering and aid in the conservation of the health of our patients.

210 *Medical Arts Building.*

A REVIEW OF THREE HUNDRED CASES OF KIDNEY INFECTION.*

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The subject of kidney infections is such a large one that this discussion will be limited to the etiology and treatment. The symptoms, diagnosis and pathology have been rehashed thoroughly and need no repetition at this time. This study is based on a series of three hundred kidney cases treated by the writer.

Disease of the kidney has been ascribed chiefly to two conditions, the first being interference with drainage, the second, the result of

*Read at the fifty-fifth annual meeting of the Medical Society of Virginia, in Staunton, October 14-17, 1924.

an over-supply of bacteria to the kidney. Bugbee says: "Too much stress cannot be laid upon the factor of the supply of toxins and bacteria to the kidney, and it should not be studied or treated until a thorough knowledge of the patient's general condition, as regards focal infection, is studied." We are all familiar with the remarkable power the kidney possesses of responding to overwork, as long as drainage is adequate and the supply of toxins not too great.

The outstanding feature in this study is the large number of patients who have been subjected to one or more operative procedures, without relief of their pain and other symptoms. Over thirty per cent of this series had had an abdominal operation without relief. The pre-operative diagnosis in this list of operative errors is given in the order of frequency: 1, appendicitis; 2, ovarian disorders; 3, gall-bladder disease; 4, malposition of the uterus; and 5, abdominal adhesions.

Nichols says: "Over thirty per cent of a series of hydronephrosis cases treated by him had either an appendectomy or gall-bladder operation without benefit." Cabot, in a report of one hundred and fifty-three cases of stone in the urinary tract, found that sixteen per cent of the cases had had an operation for some other condition without relief. Numerous other writers might be quoted to bear out the contention that many cases are being operated on for abdominal conditions, when the pathology is in the kidney.

It rests with urologists to aid in eliminating this large per cent of error in surgical diagnosis, and to point out the necessity of more careful collaboration of the general surgeon and internist with the urologist. Such a high per cent of error in pre-operative diagnosis, without a careful urinary examination, is inexcusable. With the exact methods of diagnosis we now possess, it is quite possible to eliminate the urinary tract before operative measures are contemplated. Caulk, Braasch, and others urge the necessity of careful cystoscopic examination in all cases presenting vague abdominal symptoms with pain. Pain produced by obstruction of the ureter is often confused with abdominal conditions, and often requires a careful urological examination to differentiate them. In cases where the urinary tract is suspected and the urine negative, a pyelogram will often clear up the diagnosis and may reveal a ureteral kink, a ptosed kidney, a beginning hydronephrosis, an ureteral stricture, etc. Infection of the kidney is very prone to cause dilatation of the pelvis and ureter, with subsequent elongation, producing sagging of the kidney with stasis of urine.

Etiology

The cause of renal infections may be divided into two groups: 1, Congenital, and 2, Acquired.

Under congenital we have: (a) malposition, i. e. ptosed and pelvic kidneys; (b) aberrant blood vessels interfering with drainage; (c) horseshoe kidney and other abnormal fusions; (d) ureteral anomalies. That *congenital* lesions are not infrequently seen is evidenced by the reports of various authors. Braasch reports 144 cases of duplication of the ureter, and is of the opinion that such anomalies are prone to develop into pathological and surgical conditions, hydronephrosis being the commonest complication. Further refinements in diagnosis will doubtless reveal many more such conditions.

The *acquired* etiological factors are the most frequently seen, and may be divided into predisposing and primary. The former includes the conditions which interfere with drainage, such as stone in the ureter, stricture, trauma, pressure from an adjoining viscus, excessive functions, cystocele in women, etc. The primary causes play a large role in the etiology of kidney infections, and are usually a metastatic involvement from foci located elsewhere, such as the tonsils, teeth, sinuses, intestinal tract, seminal vesicles, etc.

That bacteria may pass through a healthy kidney without damage is a well established fact, so, in order for the kidney to become infected, one of two things, or a combination of two, must occur. The first is interference with drainage, illustrated by the pyelonephritis of pregnancy, and that seen accompanying prostatic hypertrophy. It is in this group that the colon bacillus is so frequently found, occurring in as many as ninety per cent of the cases. The second group include cases where abnormalities of the urinary tract cannot be demonstrated, and are probably due to bacteria entering the kidney from a focus of infection. That various strains of the cocci group have the power of elective localization in the kidneys is shown by the work of Rosenow, Bumpus, and others. Rosenow was able to produce renal calculi in eighty-seven per

cent of a series of animals with organisms isolated from patients with nephrolithiasis. This was done under careful control and is most conclusive. Bumpus is of the opinion that streptococci are the primary bacteria found in these hematogenous infections, paving the way for the urinary scavengers, the colon bacilli, to step in and produce chronic secondary infection. Cabot and Crabtree emphasize the role the colon bacillus plays, pointing out the many fallacies attending infections by other devious channels. It is clearly shown that ascending infections along the ureter may, and do, occur, especially in the presence of some ureteral obstruction. Many writers have contended that bacteria pass directly from the colon to the kidney by the lymphatics, but, as Cabot says, in view of the present findings, they are arguing on highly insecure grounds, and Bugbee is also of this opinion. Regurgitation has been frequently observed under the fluoroscope, and doubtless accounts for the majority of ascending infections. It has been shown that regurgitation occurs in the ureter, causing the bladder contents to be propelled into the kidney. Kretschmer, using a solution opaque to the X-ray, observed that solutions enter the pelvis in normal as well as diseased bladders, as a result of regurgitation. I have seen several cases in which the kidney, ureter and bladder were a large dilated sac, the ureter being greatly distended with no evidence of closure at the ureteral orifice. Whether the hydroureter was a result of the infection, or the infection a result of the dilatation, I was not able to determine, though the hydronephrosis and pyelonephritis seen with prostatic adenoma, leads one to believe the dilatation is the primary pathology, i. e., a result of obstruction. A predisposing factor frequently seen in this series was cystocele with resultant residual urine in the bladder, occurring in parturient women. This pathological process has proven to be quite a factor in infections of the female urinary tract, and occurs also in pregnancy.

Eisendrath points out that infections of the ascending type take place through the periureteral lymphatics and cites experiments he has done on aimals to support his theory. In view of the segmental lymph drainage of the ureter, emptying chiefly in the sacral lymph nodes, it is highly improbable that this occurs. Judd calls attention to the above fact. That organisms may enter the lymphatics and reach the kidney through the blood stream has been frequently observed in urinary trauma, and probably accounts for the majority of the infections other than hematogenous. Blood cultures made following trauma to the urinary tract have repeatedly demonstrated colon bacillus in pure cultures. Infections of the colon probably reach the kidney by this route. Kretschmer, in a report of two hundred cases, found gastro-intestinal lesions in thirty per cent of the series. A syndrome noticed quite frequently is infection of the kidneys occurring as a result of or in conjunction with pus conditions in the abdomen. In several cases coming in the hospital for appendectomy, where the diagnosis was confirmed at operation, pus and red blood cells have been found in the urine. This has also occurred during convalescence following operations. It has been termed by me "kidney-appendix syndrome." Whether the kidney involvement is due to a bacteremia or direct extension has not been determined. It presents a troublesome and frequently seen complication, often puzzling in symptomatology with marked hyperpyrexia and is probably the result of an overwhelming dose of bacteria circulating in the blood stream. Crabtree, in a report of pyelitis of pregnancy, found some degree of urinary stasis in many of his cases, with rather a large amount of residual urine, varying from 30 to 480 c.c. in quantity. He says there is some degree of hydronephrosis, with or without infection, during gestation, often due to kinking of the ureter. This was found to be true in many of my cases, the obstruction occurring just below the uretero-pelvic junction. Pyelitis of pregnancy has caused a great deal of discussion, as to the primary cause of this most unfortunate condition. I have found in most of these cases, where a pyelogram was made, that some form of obstruction has been found in the ureter. Five cases had a definite kinking of the ureter with hydronephrosis, as a result of the foetal parts making pressure on the ureter. In many others, the obstruction was found low in the ureter, as a result of ureteral stricture, with a slowing up of the urinary stream. Hunner has pointed out the seriousness of these ureteral conditions in producing renal stasis with pain, and has found a large per cent of bilateral strictures in his cases. I have seen quite a number of ureteral strictures demonstrated by a pyelogram and wax bulb. A combination of these two procedures, in my opinion, is necessary to correctly diagnose ureteral stricture.

XUM

A plain ureteral catheter will not show them. That dilatation of the ureter is of frequent occurrence is evidenced by the work of Hirsch, in which he found thirty per cent of a series of necropsies in pregnant women has some form of dilatation of the ureter and renal pelvis.

A combination of renal stasis with an oversupply of bacteria has been found the causative agent in this report in cases other than those caused by the tubercle bacillus. That a primary infection may occur as a result of bacteria having a predilection for kidney tissue has also been seen in quite a number of these cases. In those cases having focal infections in the oral cavity, refusing to have the focus eradicated, the infection persisted until the cause was removed, showing that it is necessary to clear up the tonsils and teeth to effect a permanent cure.

Treatment

The treatment of kidney infections may be divided into three groups, depending on the pathology present. In the first group, where the infection is acute and fulminating—the so-called pyonephroses—early removal is indicated. The kidney is functionless and may serve as a focus to involve the other kidney, so that an early nephrectomy is the procedure of choice. In the second group, especially those caused by the streptococcus, with only partial loss of function and the patient's general condition good, rest in bed, restricted diet, forced fluids and either the oral or intravenous administration of gentian-violet or mercurochrome is of benefit. Young reports a number of cases where these dyes have acted as life savers. These antiseptics may fulfill a great and long felt need for some harmless but potent antiseptic, which may be given intravenously or even by mouth. In a recent report Young calls attention to the marked bactericidal action mercurochrome has when given by mouth. Both the gastro-intestinal and urinary tract share in the germicidal action of this drug.

In one patient recently treated, the patient refused cystoscopic treatment, so mercurochrome was given intravenously every second day. The urine cleared up, and the patient made a rapid recovery. Several other cases responded in a similar manner to its use.

In the third group, the chronic pyelonephritides, expectant treatment has been disappointing. Drainage is the prime essential and should be established just as soon as the acute stage has subsided. Dilatation of the ureter with pelvic lavage, using silver nitrate in one per cent solution is most beneficial. Personally, it is believed that dilatation can be done with less reaction, using graduated ureteral bougies, up to 11 French. If the infection is the result of some predisposing factor, i. e., lack of drainage, this must be remedied before a cure can be expected.

It has been shown that ninety per cent of those reaching adult life have septic mouths, so our chief effort should be directed to the teeth and tonsils as a source of infection. These were found to be infected in over seventy per cent of this group, the other thirty per cent being possibly from the sinuses, colon, etc. The teeth should be X-rayed and the tonsils removed in all cases presenting urinary symptoms. This may sound radical, but so many cases have been seen in which the kidney infection persisted until the foci were removed, and then cleared up, that I feel justified in making this statement.

Pyelitis of pregnancy is a very difficult condition to cure, and requires drainage, often over long periods of time. Continuous pelvic lavage, using a two-way catheter, has proven of value where simple lavage and drainage was ineffective. In pronouncing a patient cured, it is very necessary to have the urine free of bacteria as well as pus. I have seen cases with no pus in the urine, but after carefully centrifuging the urine and examining the stained sediment, large numbers of bacteria were seen. Whether or not formaldehyde liberating drugs really exert any bactericidal action on organisms at the kidney level, still remains in doubt. If used, they should be given often and in rather large doses, first insuring a high acidity of the urine by means of acid-sodium phosphate. Leonard is of the opinion that hexyl resorcinol possesses all the requirements for an ideal internal urinary antiseptic.

In passing, it may be stated that both autogenous and stock vaccines were used in the treatment of quite a number of these patients, but, as far as could be ascertained, no brilliant results were obtained by their use. They may possibly aid in increasing the patient's opsonic index.

Three cases have required kidney suspension, as the kidney was found in the lower lumbar

region in each case. Pyelograms made some weeks after operation showed the kidney to be well in place. It has been necessary to remove but two kidneys, one being an acute fulminating streptococcus pyonephrosis with no excretion of 'thalein in thirty minutes. A section was made of one kidney by Dr. J. B. Bullitt, who said, "The kidney shows signs of an acutely superimposed infection on a chronic nephritis. The pelvis was filled with a grayish membrane with necrosis of the pelvic mucosa. Throughout the kidney substance were many small punctate areas of necrosis." The other kidney was studded with small abscesses involving much renal tissue. One other septic kidney required drainage, but recovered quickly when drainage was established. No deaths occurred in this series.

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SOME REMARKS ON UNILATERAL HYDRONEPHROSIS.*

By JOHN H. NEFF, M. D., University, Va.

Hydronephrosis, in common with other surgical conditions of the ureter and kidney, frequently presents a most deceptive symptomatology. By the time of a late diagnosis, renal destruction may be far advanced and the opportunity for conservative surgery may thus have passed; the more regrettable because the therapeutic problem in early hydronephrosis is so essentially one of mechanics and, at least theoretically, should thereby be the easier for surgical solution. Such facts, we feel, warrant frequent discussion of hydronephrosis and give value to case analyses.

We propose to discuss some of the current views concerning unilateral hydronephrosis in the light of our own experience. The unilateral type is of most interest both because it far outnumbers the bilateral form and because it more often allows curative rather than palliative treatment.

Intermittency or incompleteness are commonly considered the characteristics of all ureteral obstructions that produce hydronephrosis. To cause much pelvic dilatation there must be periods of more or less free drainage even though at times the obstruction may be complete for hours or days. Total permanent ureteral occlusion in human beings is thought shortly to result in renal atrophy with but little preceding dilatation.

In contrast to this latter view, Hinman and

*Read at the fifty-fifth annual meeting of the Medical Society of Virginia, in Staunton, October 14-17, 1924.

Lee-Brown report in animals the almost invariable development of a large hydronephrosis after ureteral ligation. This they explain as due to continued urine secretion made possible by a process which they call "pyelo-venous back-flow"—namely, that with an intrapelvic pressure short of renal secretory pressure, the pelvic contents gain entrance into the venous spaces at the bases of the pyramids and hence into the general circulation and, further, that this communication, once established, the "back-flow" will continue at gradually decreasing pressures. If this observation be correct and if it be true that ureteral ligation in human beings does not cause hydronephrosis, it would seem that "back-flow" does not occur in human beings under conditions analogous to its operation in experimental animals. Nevertheless, the experimental work of Hinman and Lee-Brown is so convincing that one feels their assumption of the operation of pyelo-venous drainage in humans is justifiable. Certainly some type of re-absorption is required to explain the progressive dilatation during a period of prolonged ureteral closure, because else there would very soon be a balance between the intrapelvic and secretory pressures and, therefore, cessation of secretion.

There are so many conditions, congenital and acquired, within or without the ureter, which may obstruct the duct that even an approximately complete list of reported forms would be lengthy. Modern facilites for thorough and graphic study of the kidneys and ureters usually make possible their demonstration and accurate classification prior to treatment. A congenital defect is found to be the responsible factor with fair frequency. Variations in the development of the kidneys and ureters may result in ureteral duplication, malposition of the ureteral orifices, ureteral valves or strictures, incomplete ascent or rotation of the kidney, horse-shoe kidneys and so on, in any of which inadequate pelvic drainage may be involved. Aberrant vessels going to the lower pole of the kidney, and so making pressure upon the ureter, fall in the congenital category. There is not entire unanimity of opinion as to how often such vessels, even when present, are of etiological importance. Kelly points out that in many of the large hydronephroses the vessels are drawn out of place and so seem to obstruct the ureter when primarily they have had no such effect. He believes that many times it is not aberrant vessels alone which are causative, but these combined with abnormal renal mobility. Such supernumerary vessels were the predominant factor in the obstruction in one of our cases. Other causative congenital defects in our series were horse-shoe kidney twice, ureteral diverticulum once, stricture of the ureter once.

The valve-like obstruction at the pelvo-ureteral juncture produced by the duct leaving the pelvis at an acute angle or by the so-called high implantation of the ureter into the pelvis, may represent developmental variations and so deserve congenital classification. In many cases where such deformity is observed, the kidney is also quite low and the question arises whether the seeming high ureteral implantation is not really secondary to the descent of the kidney and dilatation of the pelvis. The supports for the kidney and upper portion of the ureter are quite different; ptosis of the kidney does not necessarily imply ptosis of the adjacent ureteral segment which, by maintaining a relatively normal position, would then produce this very type of obstruction.

It can, of course, be equally argued that the renal ptosis may be a secondary manifestation and due to the increased weight of the hydronephrotic mass. No doubt the sequence of events may be either way. While we incline to the view that ptosis is more often the prime factor, we have seen several cases where the kidneys were in high normal position and the obstruction clearly of the valve type at the pelvo-ureteral junction. In our total series of twenty-six cases, this type of obstruction—with or without ptosis—has occurred eleven times and has so proven to be much the most common etiological factor.

Numerous statistical studies of the etiology of hydronephrosis show acquired obstructions much outnumber congenital forms. In our own experience the proportion has been about as three to one if the major part of the pelvo-ureteral juncture obstructions are included in the acquired group.

Frankly of the acquired type, we have pressure upon the ureter by various pelvic, abdominal or retroperitoneal tumors, occlusion of the duct by stone, tumors or strictures, blocking of greater or less degree produced by ureteral twists or kinks. We have observed causative extra-ureteral pressure twice, once by the pelvic recurrence of a carcinoma of the cervix, once by a perirenal cyst of undetermined origin. The obstruction was made by calculi in two of

the series and both times the stones were in the pelvis. A moderate amount of pelvic dilatation is the practically constant finding where calculi have been obstructive for any period of time. We have included in the series under discussion only the instances of very marked dilatation and with a slight infection. Pyonephrosis has been, on this basis of division, a very much more frequent result of calculi than hydronephrosis.

Of the remaining eight cases, four presented ureteral strictures and four showed kinks or twists of the ureter. It is frequently not clear how much importance should be attached to the latter in the etiology of hydronephrosis. So often they are merely evidence of lengthening of the ureter from some lower obstruction and hence are due to the same back pressure which produces the renal change. This we have seen on not a few occasions. In considering interference with free ureteral drainage, one, of course, always bears in mind the fact that the ureter functions, not passively, but by active peristalsis. Waves of peristalsis can be as effective around quite sharp curves as along the normal relatively straight course of the duct. Yet there is a definite group in which kinks are of primary importance. They are seen as very sharp angulations of the duct or in flat S-shaped twists.

While the various ureteral obstructions we have specifically mentioned by no means exhaust the possibilities, they fairly well exemplify the main general types.

The characteristic gross pathological picture of hydronephrosis is dilatation of the pelvis and calices with thinning out of the renal parenchyma. If the obstruction is low, the ureter too has become dilated after an ineffective original hypertrophy. Braasch states that with a low ureteral obstruction the dilatation is predominantly in the calices, secondarily in the pelvis, while with a high obstruction the pelvis distends to a relatively greater degree than the calices. The increased intrapelvic pressure is exerted directly upon the secretory apparatus, thus interfering with tubular drainage and the intrarenal circulation, and results in final glomerular and tubular atrophy. Hinman and Lee-Brown believe that much of the parenchymal degeneration is ischemic, stating that an impeded intrinsic circulation is the intermediary factor between increased renal tension and destruction of the tubules and glomeruli. The infiltration and sclerosis of chronic inflammation play a destructive role where a not infrequent secondary infection has occurred. Exactly half of our cases were infected.

In reviewing the histories of our patients we have been forcibly impressed with the insidious manner in which hydronephrosis may develop. While a good majority of the cases had had rather characteristic Dietl's crises at one time or another, frequently over long periods, they suffered nothing more than a grumbling abdominal discomfort and this indefinitely localized. In one patient, seen during her first attack of pain, the kidney was nothing but a mere shell. Dilatation and gradual renal destruction obviously must have antedated the one painful attack for months at least. In two more advanced cases—both also infected—no history of any pain whatsoever could be obtained. The period of complaint prior to admission, in the twenty-four patients that did have pain in one degree or another, varied between a few days and thirty years.

Chronic gastro-intestinal symptoms may be more prominent in the patient's complaint than pain. Such manifestations are no doubt reflex or else evidence of a slight toxemia, possibly both in some instances. Bladder irritation has been relatively uncommon in our series unless there was some secondary infection. A third of the patients had a palpable mass when first seen and several, in whom we could feel none, had previously presented such according to the referring physicians.

With the modern facilities available for examination of the upper urinary tract, there is no reason why a palpable hydronephrosis should be mistaken for any other condition. Nor should errors be frequent in those cases where the pain is at all typical of renal colic or in patients with pus or blood in their urine whatever their pain may be like. Here we have imperative indications for thorough urological study. The thoughtful employment of ureteral catheters, pyelography and tests of kidney function will rarely lead one astray. In the small but not negligible group where there are only vague abdominal complaints, an early diagnosis depends on the awareness of the attending physician and urologist that hydronephrosis is one of the conditions that may be underlying.

The scope of this paper is not such as to allow a detailed account of the urologist's technique in demonstrating a hydronephrosis. Suf-

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fice it to say that in the early cases—at the stage when accurate diagnosis is of greatest importance—the interpretation of pyelo-uretrograms is not always easy. Nice judgment may be required to distinguish between early dilatation and a large normal pelvis. Contrast with the opposite side is then helpful since the two pelves are almost invariably of the same size and type in a normal individual. Conclusions cannot be drawn from ureters and pelves incompletely filled, nor must a point of peristaltic contraction be mistaken for a stricture. And, as mentioned above, there is danger in attaching importance to a demonstrated kink or twist if the ureter below has not been shown to have a normal outline.

The treatment of unilateral hydronephrosis hinges upon the extent of kidney damage and the type of underlying obstruction. Obviously, for the far-advanced cases when the kidney has been thinned out to a mere shell, no operation short of a nephrectomy is worth while. In our series there were fifteen operations and ten of these were nephrectomies. A recent report from the Mayo Clinic states that 475 nephrectomies were required in the treatment of 503 cases of hydronephrosis. Such percentages are damning evidence of the late stage at which most patients submit themselves for operation.

In the early cases conservative measures are as clearly indicated as nephrectomy in the late ones. Here we have kidneys which have suffered only slight damage and which, granted free drainage, may function even as well as their normal mates. For these, the first essential is a very accurate diagnosis of the site and type of obstruction, and then relief of this by the simplest method possible. An operation of one kind or another is usually required. For example, in our own cases there were three plastic operations at the pelvo-ureteral juncture, one fixation of the kidney along with division of aberrant vessels, one ureteral diverticulectomy. It is worthy of mention that seven patients with early hydronephrosis refused to submit to an advised operation. In view of what has been said above, these may well turn up at some later date as candidates for nephrectomy. The early cases with ureteral strictures alone can frequently be handled by dilatation. We have now under observation a patient in whom we have been dilating not only a low stricture but also one at the pelvo-ureteral juncture. While there has been no decrease in pelvic capacity—between two and three ounces—the phthalein excretion has increased from one-half normal to normal and a rather heavy infection has entirely cleared up.

Unfortunately, in hydronephrosis there is a group of cases for which it is difficult to decide whether the kidney should come out, or whether conservation should be attempted in the hope that not only will a moderate function be retained, but that function will improve after adequate drainage is established. It is probably safe to say that the present day attitude in such circumstances is to give the kidney a chance even though a later nephrectomy may be required. This usually involves some form of plastic repair and often an additional nephropexy. Many of these procedures fail to secure the needed pelvic drainage. Of thirty-nine plastics at the Mayo Clinic, eleven had to be followed by nephrectomy. Quite recently, Hinman has taken the position that it is thoroughly futile to attempt preservation of a kidney much damaged by hydronephrotic changes when the opposite kidney has undergone even partial compensatory hypertrophy. Basing his views upon extensive experimental data, he states that even though the obstruction of such a kidney is entirely relieved the ultimate result will be disuse atrophy. This degenerative change he considers evidence of a lack of renal reserve power and, because of such lack, the kidney has been unable to meet the competition in work of its hypertrophic fellow. This is a new proposition in renal surgery. If it proves to be a correct one, cases of hydronephrosis will much more automatically divide themselves into groups justifying conservative measures on the one hand, and nephrectomy on the other. For the time being, however, we continue to advocate conservative surgery in these middle zone cases until there are further clinical studies corroborating Hinman's work.

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DISCUSSION OF PAPERS BY DRS. DODSON, STIRLING AND NEFF.

DR. J. E. RAWLS, *Suffolk*: These papers have been very interesting to me, and especially from the general surgeon's standpoint. The paper that I especially enjoyed was the one of Dr. W. C. Stirling, reviewing three hundred cases of kidney infection. I

was interested in the point Dr. Stirling brought out when he said the kidney was frequently a secondary infection. I think that is undoubtedly true. I remember a case I had ten years ago. The patient suffered very much with "indigestion." She was given treatment, which seemed to clear up this condition. About six months after this she developed a severe kidney infection, and suffered with this a long time. Frequently she would get relief partially. She consulted another for help and I didn't see her for several months, when one day, I met her on the street. She had gained considerably and was feeling well and happy. When I asked her the reason for her improvement, she said she had had her teeth X-rayed and most of them extracted, and had not had any trouble since. That was ten years ago and she is well and happy today. Dr. Stirling emphasized the fact of examining your patient, especially as to focal infection. If we do this thoroughly, we will be able to relieve a great number who suffer from kidney infection, and the general practitioner will do well to make closer examinations along the line of focal infection.

DR. EDWARD H. RICHARDSON, *Baltimore, Md.*: I have listened with a great deal of interest and profit to these papers. Of the number of points which they suggest for discussion, I have time to stress only three. And what I say is intended to apply only to women, since my urological work is confined to that sex.

Dr. Dodson's paper reviewed admirably and with excellent pictorial reproductions a variety of bladder lesions, the initial symptom in each one of which was frequency of urination. The serious character of many of the conditions he showed should impress upon all of us with unforgettable clearness that we cannot afford to disregard this symptom, even when the catheterized bladder urine is chemically and microscopically negative; for if we do, such end-stage pathology as he demonstrated will in a large percentage of the cases be the final result.

Dr. Neff's splendid paper strengthened and supplemented this idea, showing with uncommon forcefulness the damage that neglect of early symptoms may produce in the upper urinary tract.

The so-called Hunner, or "elusive" bladder ulcer, is a definite pathological entity of a serious nature; it partakes of the nature of a phlegmon involving the entire thickness of the bladder wall. Radical and extensive bladder resections have in some cases successfully eradicated the disease. But a note of warning should be sounded, because even after the most extensive resections there follows a definite percentage of recurrence. I am, therefore, not yet fully convinced that this is the best treatment. We need more light on this subject.

Finally, let me emphasize the ureter stricture is neither a fad nor a myth. It is a surprisingly common lesion responsible for a most heterogeneous symptom-complex. Failure to recognize this fact is responsible for many cases of hydronephrosis and other kidney sequelae of a destructive nature.

My plea, therefore, is for the more general use of complete urological studies, including cystoscopy, in every case of persistent frequency of urination. Only by this means can such end-stage pathology in the urinary tract, as has been shown here today, be forestalled.

DR. R. C. BRYAN, *Richmond*: I have been very much interested in these papers and I do not believe I could get started good on my remarks regarding them in less than an hour.

I want to thank Dr. Dodson for his paper on Frequency of Urination; Dr. Stirling for his paper on Kidney Infection, and Dr. Neff for his paper on Hydronephrosis. I shall never forget the pleasure and benefit I have gotten from these papers.

DR. L. T. PRICE, *Richmond*: I want to express my appreciation of the papers just read. As you know, the bacterial infection in the urine comes down from the kidneys and is the direct cause of the inflammation that accounts for the frequency of urination and, until this infection is cleared up, there is no hope of relieving the patient. This infection has been called a good many different things and treatments have been given to relieve the patients temporarily, only to have a recurrence soon. Many of these cases have been treated for several years without any apparent result. In the female, for instance, a woman who has borne a child and has had a laceration which may have caused a cystocele cannot be relieved without repair of this cystocele.

I believe, however, we have lost sight of the physiology of the kidney. If we would go back and keep the urine normal, as it should be, we would relieve a great many of these cases who have frequency of urination. The function of the kidney in taking from the blood what it should take and leaving what it should leave, is something I don't believe we understand. If we would get the physiology of the kidney worked out along this line and find out more about what the kidneys should do, it would give us considerable light on this subject. Dr. Dodson's paper covered the various conditions that cause frequent urination except stone in the bladder.

DR. GEO. T. KLIPSTEIN, *Alexandria*: I think Dr. Stirling's paper on kidney infection was extremely interesting. I remember having a patient once who suffered from constant urination for twenty-one years. She had been under a very efficient physician in Washington for some time without any benefit. Then she went to Baltimore, where she was operated upon without much improvement. It was a very difficult case to handle. It was found later that the whole trouble resulted from focal infection. She suffered one day with toothache and the tooth was removed. There was pus at the root. Later it was found that all the teeth were infected. They were removed. After this she began to gain in weight and she was restored to normal health. This was all due to bad teeth.

THE SURGICAL TREATMENT OF PULMONARY TUBERCULOSIS.*

By F. S. JOHNS, M. D., Richmond, Va.

Since the original work of Brauer, the German internist, and his colleague, Friedrich, a surgeon of Marburg, in 1907, the surgical treatment of pulmonary tuberculosis has made rapid progress in Central Europe and other countries abroad. Until the past two years, the medical profession of North America did not take a vital interest in this work. I am convinced, however, that any treatment which cures thirty-five per cent of a class of advanced cases, and greatly improves another thirty per cent, should challenge our most serious attention—and is worthy to be presented before this Academy.

*Read before the Richmond Academy of Medicine, January 13, 1925.

A single European surgeon reports more than 500 thoracoplasties performed in the past five years. The entire number of cases reported by both United States and Canadian surgeons does not exceed 120. Alexander states that there are at least 15,000 cases in the United States which should have some form of surgical compression. This means that from six to eight per cent of all tuberculous cases under treatment should be classed as surgical.

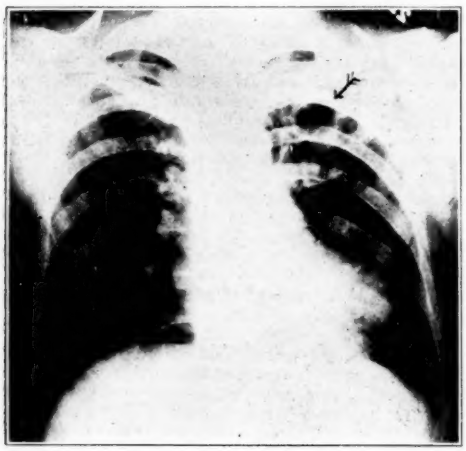


Fig. 1. Case I. Mrs. D. Before operation. Two cavities in left apex.

The question faces us: What is responsible for this neglected group of cases, usually given up to their sad fate as "hopeless"—so far as any cure shall further concern them? It is possible that the internists in charge of these cases lack confidence in the surgeons. Else, have they followed closely the progress made in the surgical treatment of this disease? And, finally, has each case been checked up both before and after gas refills, so that it may be definitely determined whether or not adhesions are responsible for the inadequate compression results? These are the questions which must arouse the internist if such doomed cases are to come to the surgeon with a reasonable chance for recovery.

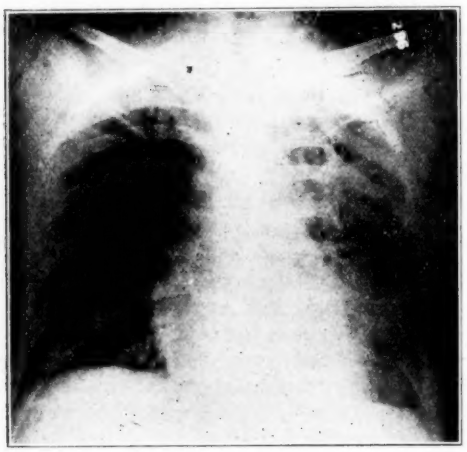


Fig. 2. Case I. Mrs. D. After complete resection of tenth to first ribs, inclusively.

Mechanical compression for the treatment of pulmonary tuberculosis is not a new procedure. More than a hundred years ago, James Carson suggested this type of treatment. In 1885, DeCerenville did the first recorded thoracoplasty. He resected very limited sections of

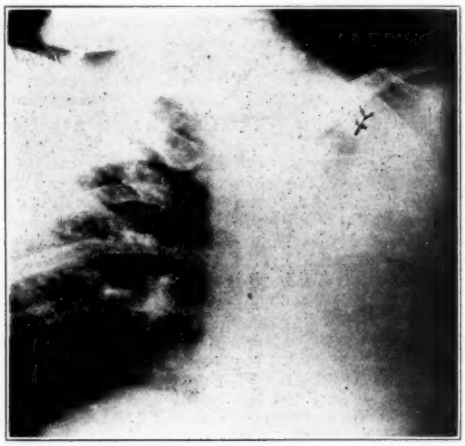


Fig. 3. Case II. Mr. W. Before operation. Cavity in upper lobe of left lung.

the upper ribs anteriorly. Improvement was noted. Since that time various types of operation have been advocated as is the custom in any new surgical procedure. The early operations being radical carried a high mortality, an example of which was the Shede operation used by Friedrich for his early compression cases. Those of you who have done this operation for other chronic conditions will agree that it is a major operation, even for a patient who is not a victim of advanced tuberculosis. Various modifications followed, until Sauerbruch, Friedrich's assistant, introduced the two-stage operation which is generally in use today.

This operation consists of a resection posteriorly of sections of the tenth to the first ribs inclusive. It should be done in at least two stages. The lower five ribs should be resected

first so that compression of the lower lobes will limit as far as possible the chances of aspiration. The decrease in the capacity of the chest after thoracoplasty depends not only on the amount of ribs resected but also on the parts resected. Saugman resects 130 cm. from ten ribs including their posterior extremities. He has found that this reduces the capacity of the chest one-third, which reduction is sufficient for the average case.

Colleta[1] has shown that when a lung has been compressed by thoracoplasty or pneumothorax

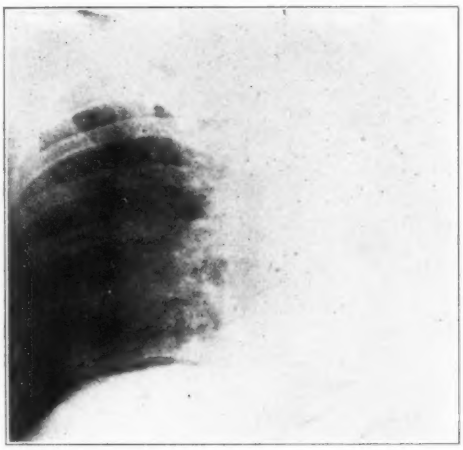


Fig. 4. Case II. Mr. W. After resection of eleventh to sixth ribs, inclusive. Note collapse of lower lobe. Second stage to be done later.

it receives a greater amount of blood supply rather than a lesser one. This is due to the fact that in a collapsed lung there is a stretching which causes narrowing of the lumen of the vessels. It has also been shown that a compressed lung which has controlled its tuberculous lesion is abundantly supplied with connective tissue around the blood supply and bronchi. Necropsy reports also show that the amount of connective tissue in a compressed tuberculous lung is far in excess of the one uncompressed, and that it will form in a cachectic person in whom it could not be expected were the lung uncompressed.

The cases suitable for thoracoplasty should have had the usual routine sanatoria treatment plus intelligent use of artificial pneumothorax. There should be no tuberculous condition elsewhere in the body and the disease should preferably be confined to one lung; if there is an involvement of the so-called good lung it should be inactive. Of course, the ideal does not always exist, and there are cases with activity in the better lung which are greatly benefited, if not entirely arrested, by thoracoplasty. But one should be cautious about operating where there is any active process in the good lung, lest harm result to the patient and the operation itself get a bad reputation.

I believe I am safe in saying that the internist in charge of tubercular sanatoria have not so far been enthusiastic about referring cases suitable for thoracoplasties early enough; they have continued to treat them with hopeful but poor results, until finally the patients are referred for surgical compression as a last resort. Surgical treatment of such advanced cases is anything but encouraging. Both internists and surgeons familiar with this work urge that cases which are not progressing under the usual treatment have the operation early. Davies advises operation if there has been no improvement after six months of faithful sanatorium regime. But if a cavity exits he advocates operating at once. To get the best results there must be a close co-operation between internist and surgeon; so that those cases which are not responding to general sanatorium treatment plus artificial pneumonthorax may be recognized promptly and a surgical compression done in the early stage.

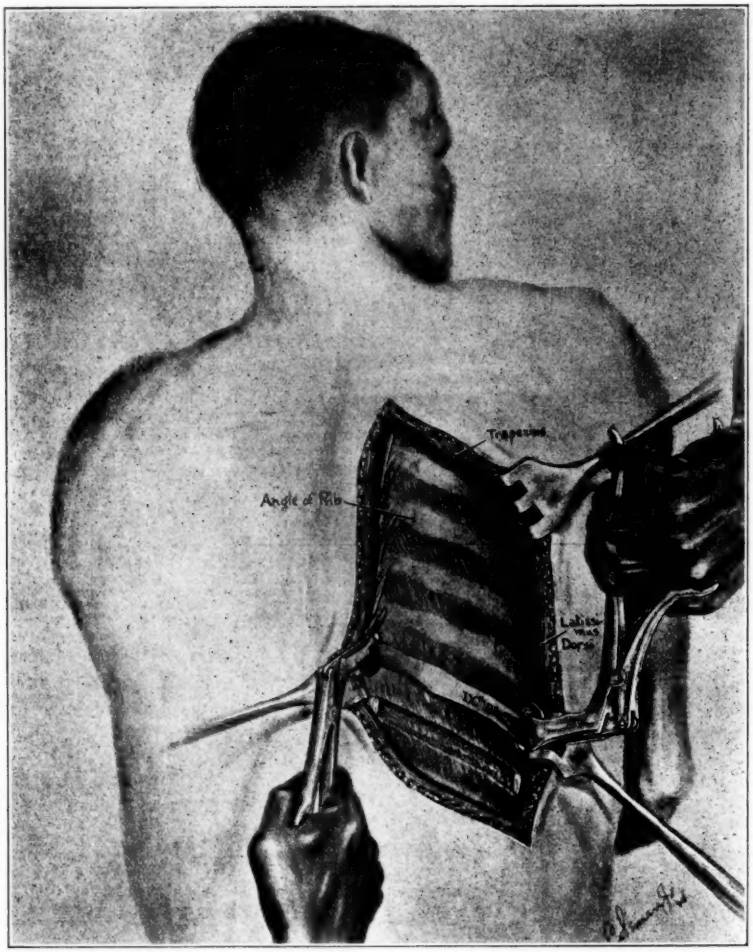
I want to emphasize a few important facts concerning the preparation of these cases for operation. It is essential that all the findings be thoroughly discussed by the internist and the surgeon prior to the operation, because upon this exchange of ideas frequently depends the success or failure of a given case. Every case should be digitalized before operation. Many patients have cavities of considerable size, and for this reason it has been recommended that they be given time to empty the cavities as far as possible by getting up as much sputum as they can before the operation. In order to put this into practice it is advisable to operate later in the day rather than in the early forenoon.

The choice of anesthetic is left with the individual surgeon. On the Continent one finds many surgeons recommending ether and chloroform. Sauerbruch uses novocaine combined with ether. I am satisfied that all of these cases could be done under novocaine anesthesia, but I do not believe this is always wise. There is a certain type of nervous individual that takes local anesthesia badly. Such a one is not only sure to worry and cause a prolonga-

tion of the operation, but will become exhausted before the operation is completed. In this type of case I feel that novocaine reinforced with ethylene makes an ideal anesthetic. Any anesthesia that causes a long-drawn-out operation should not be used. A word of warning should be given as to the too free use of novocaine. Deaths from its misuse are being reported by many clinics. Our plan is to do a thorough operation in as short a time as possible.

There are certain important points to be noted here in the post-operative care of thoracoplasties. The head of the bed should be elevated. Morphine should be given for the first twenty-eight hours. The compressed chest wall should be securely strapped so that there will be no bulging on coughing. To get the maximum compression, it has been suggested that some form of compression binder be worn for about six months. Regeneration of the ribs is very rapid and a new chest is soon formed.

There are definite indications for phrenocotomy and apicolysis. Thus far I have had no personal experience with either of these procedures. Archibald thinks that the indication for phrenoctomy is rare, and states that if a thoracoplasty is done and the eleventh rib excised sufficient paralysis to the diaphragm is thus obtained. I feel that phrenocotomy might be of use as an index to the amount of surgery a border-line case could stand. The operation

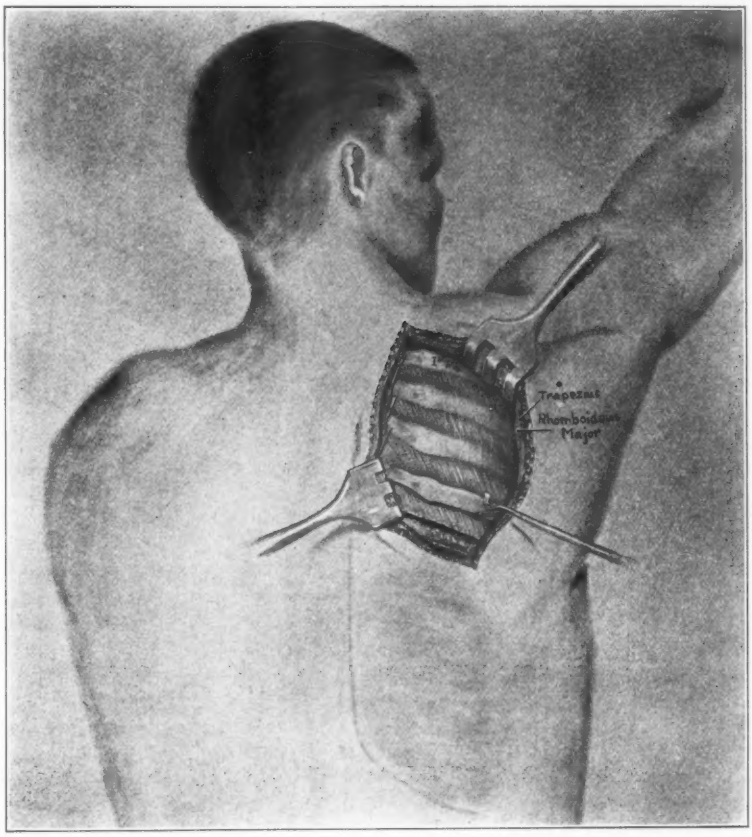


Drawing No. 1. First stage: Resection from the eleventh to sixth rib, inclusive.

is a simple one and does not tax the patient severely.

Apicolysis is used in cases with large cavities in the apex which have not been sufficiently compressed by thoracoplasty. It is not without danger and has a limited use.

Professor Jacobini's method of clipping adhesions from between the lung and chest wall has not been generally adopted, and many of his own cases developed empyema after this operation. It is passing through the experimental state and its development is incomplete.



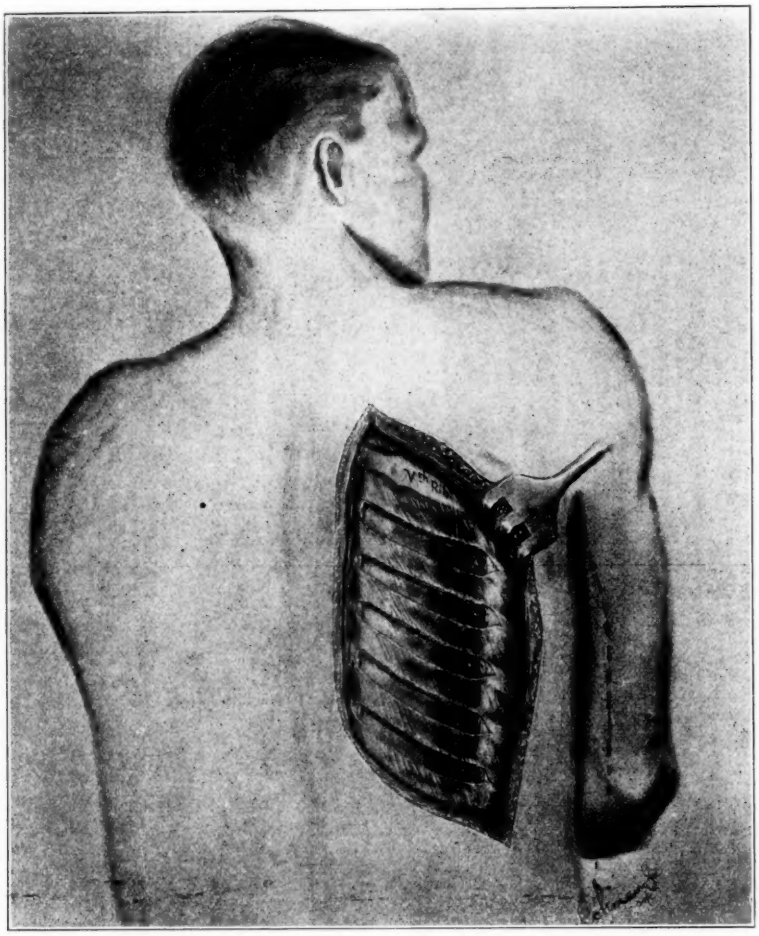
Drawing No. 2. Second stage: Resection from the fifth to the first rib, inclusive.

Report of two interesting cases. The first case I feel is ideal for surgical treatment. The second is far advanced and might be termed borderline.

Case No. 1.—Mrs. D., age forty, Pine Camp Hospital. Patient has had a definite pulmonary tuberculosis since October, 1923. When admitted to hospital, had lost twenty-five pounds. Sputum positive for tubercle bacilli. Two cavities 3 cm. in diameter in left upper lobe. Routine sanatorium treatment. Eleven attempts at artificial pneumothorax with poor results due entirely to adhesions. 180 c.c. sputum in twenty-four hours. X-ray examination: Left lung well advanced tuberculosis involving both lobes. Right lung: Slight peribronchial thickening and an occasional calcified tubercle was seen. Thoracoplasty on August 21, 1924, (resection of the first to sixth rib inclusive) under gas-oxygen-novocaine anesthesia. Mild reaction following operation. Returned to Pine Camp for continued tubercular treatment seven days after operation. Ninety days following operation patient has gained thirty-six pounds, no tubercle bacilli found in sputum. No expectoration. Patient's condition is ex-

cellent. On January 6th, second stage of operation was done. Resection from the tenth to sixth rib inclusive. Patient had an uneventful recovery.

Case No. 2.—Mr. W., age thirty-six, Pine Camp Hospital. Has had tuberculosis for five years. Advanced tuberculosis of left lung and a moderate tuberculous involvement of the to the left. Patient also has a moderate tuberculous infection of the right lung. Thoracoplasty in December (tenth to sixth rib inclusive). Local anesthesia. Slight pos-operative reaction. Maximum pulse rate 110 and temperature 99.4. Discharged from hospital ten days after operation. Continued treatment at Pine Camp Sanatorium. Patient states that



Drawing No. 3. Showing the concavity immediately following operation.

right lung. 130 c.c. of sputum in twenty-four hours. Shortness of breath on exertion. Ten attempts at refills of gas gave no results. Many firm adhesions. X-ray report: There is a very extensive tubercular infection throughout the left lung with a cavity in the apex. Dense areas of consolidation. Pleural thickening and fibrosis. The heart and mediastinum are pulled

his troublesome cough has cleared up seventy-five per cent and that his expectoration is much less. His shortness of breath has disappeared, due to a partial cardiolysis (second stage to be done later on this case).

The first case represents the ideal case for thoracoplasty. The second case is far advanced and should be classed as a borderline case. The

improvement in this case is most encouraging and is being followed with interest.

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Johnston-Willis Hospital.

HEMORRHAGIC DISEASE OF THE NEW BORN.*

By LAWRENCE T. ROYSTER, M. D., University, Va.

It is not my intention or purpose to give an exhaustive article on the subject of hemorrhagic disease of the new born. I am merely presenting this subject to you at this time as a plea for a routine procedure which would not only save life in many instances, but prevent the occurrence of a rather definite number of feeble-minded cripples.

There are many causes for hemorrhages in the new born. Septic infections and syphilis are frequently accompanied by hemorrhage, while hemophilia may manifest itself quite early in life. (In congenital syphilis prolonged clotting time and hemorrhage from slight causes, or spontaneously may occur, and this is not influenced by blood injection). Hemorrhage may be caused by trauma; this is eespecially true of intracranial hemorhage incident to obstetric manipulation. But by far the most frequent cause of hemorrhage, visible or invisible, is the so-called hemorrhagic disease of the new born.

It has long been known that Little's disease, or spastic paraplegia, hemiplegia or monoplegia with or without mental impairment was caused by hemorrhage into the cranium, either at birth or during the few days immediately following birth. For many years it was thought that all these intracranial hemorrhages were due to trauma incident to some form of accouchement force. Subsequent observations, however, showed that a considerable number of these cases occurred in infants whose birth was apparently normal. Speculation developed the theory that prolonged, though otherwise normal, labor was responsible for the hemorrhage. It was supposed that this was especially apt to be the case when the first stage of labor was unusually long, the contractions of the uterus strong, and the os rigid, thus producing prolonged pressure on the head with a subsequent laceration of the longitudinal or one of the other large venous sinuses. Even this theory did not account for all the cases of intracranial hemorrhage or those presenting symptoms of intracranial pressure, for again it was noted that in many instances there was no evidence of anything abnormal in the delivery. The condition has been studied by many observers with almost as many conclusions as there have been observers.

It remained for Rodda, however, to demonstrate the fact that in a large proportion of cases presenting signs of intracranial pressure, there was a delayed clotting time of the infant's blood at some time during the first ten days of life. This delayed clotting time may be present at birth or develop on the third or fourth day, or again later within the ten day limit. This discovery forced upon us a new classification of hemorrhage of the new born, certainly that occurring within the cranial vault.

We may, therefore, divide them into (1) those in which no trauma has occurred, and (2) those due to trauma of the head and consequent laceration of the intracranial sinuses.

In hemorrhagic disease there may be visible bleeding or invisible bleeding. Visible bleeding may occur from the mucous membrane—from the mouth, nose or intestines. This may be entirely spontaneous or, in the case of the mouth for instance, it may be precipitated by trauma such as the wiping out of the mouth too forcibly with any rough substance, such as gauze. It may occur from the umbilical cord, however well it has been tied. There may occur subcutaneous hemorrhages in the form of petechiae, or those larger and known as purpura. It may occur in any of the serous cavities or from recent wounds such as in circumcision. Under the scalp it occurs in the form of cephalhematoma. Or finally, it may occur from the membranes of the brain constituting intracranial hemorrhage of the new born.

No doubt trauma may play a definite part in the last named condition, and a prolonged labor or a forcible one may throw pressure on the child's head, precipitating a hemorrhage which might not have occurred otherwise even though there were a tendency toward delayed clotting time. The amount of bleeding probably depends on the intensity of the condition, though this is by no means proved. There may be a slight ooze from the umbilical cord or the hemorrhage from circumcision may

*Read at the fifty-fifth annual meeting of the Medical Society of Virginia, in Staunton, October 14-17, 1924.

be difficult or even impossible to control (circumcision should never be done under the tenth day unless checked by the clotting time and even then it is inadvisable earlier than this day).

A puncture wound for the purpose of taking blood for diagnostic purposes may result in serious hemorrhage. There may be a slight amount of blood accompanying the bowel movements or, on the other hand, a profuse hemorrhage may occur within the intestines or one of the body cavities so severe as to cause death without being able to discover the cause of death. Any of these hemorrhages may be very gradual and insidious, or so sudden, rapid, and profuse as to cause death before aid can be evoked. Under these conditions hemorrhage is always a serious matter, but by far the most serious and important is the hemorrhage into the cranial cavity.

Let us consider for a moment the symptomatology of intracranial pressure in general. Intracranial hemorrhage may come on before birth, even before the onset of labor, or it may occur during labor, or immediately after birth, or at any time during the first ten days of life. After this, hemorrhagic disease does not exist. The most frequent incidences of the disease are during the first twenty-four hours and during the third and fourth twenty-four hours.

There are several cardinal and classical symptoms of intracranial pressure. The first is cyanosis at any time during the first ten days of life. The infant may be born cyanosed and it may be difficult to resuscitate. There may be intermittent spells of cyanosis, the child appearing practically normal between the attacks. The child may have been apparently normal during the first few days of life and suddenly become cyanosed on the third or fourth day. This cyanosis may be so severe as to make us anticipate an immediate death, or on the other hand it may be so slight as almost completely to escape notice. Intracranial pressure is by far the most frequent cause of cyanosis in the young infant. That from congenital heart disease is comparatively rare, and is usually continuous and not intermittent. It is often difficult to distinguish between attacks of cyanosis due to intracranial pressure and those due to congenital atelectasis. In many instances such a diagnosis is impossible without a test of the clotting time.

The next most frequent symptom is disturbance of the infant's nursing. It may be difficult to get the baby to nurse at all, but the most frequent disturbance of this nature is that a baby who has nursed well for the first few days of life fails to nurse vigorously or cannot be induced to nurse at all. This may happen for one or two nursings only in the course of twenty-fours hours or for a whole day the baby may not nurse well. It may then continue to nurse as if nothing had happened. This symptom is almost always a positive indication of some degree of intracranial hemorrhage. There may be generalized convulsions from the moment of birth, or these convulsions may come on at any time during the first ten days of life, though they are far more frequent during the first few days of life. Convulsions may be generalized or local, in one extremity, or there may be only slight twitchings or fibrillations in one or more fingers or toes. Of course, symptoms due to intracranial hemorrhage from trauma are identical with these except that they almost always occur at or shortly after birth. If the hemorrhage is slow, it can be differentiated only by the blood examination.

Let us consider for a moment the extent of the hemorrhage or the amount of intracranial pressure. There may be simply an edema of the brain due to prolonged labor or the application of forceps. This may give rise to any of the signs or symptoms which have been previously described. If the edema is not of sufficient severity to raise the intracranial pressure to an extent which paralyzes respiration, the infant usually survives without any sequelae. On the other hand, it may be so severe as to cause death merely from intracranial pressure. (Repeated lumbar punctures may do good in these cases). There may be a large number of small petechial hemorrhages dotted all over the soft membrane. It is not likely that these ever produce death, and it is quite probable that they may not even produce symptoms; if they do, these symptoms are apt to be very slight. There may be a large hemorrhage from the membranes over one or both hemispheres, or the hemorrhage may be entirely below the tentorium. The single hemorrhage may be very small or may be as large as a pigeon egg. It usually becomes organized and through pressure produces permanent destruction in the brain tissue. It is likely that the subtentorial hemorrhage alone produces a bloody spinal fluid. The amount of intracranial

hemorrhage does not bear a definite relation to the severity of symptoms or to the permanency of after effects. The symptoms may be so severe in the beginning as to cause a prediction of immediate death, and yet the child may recover completely and apparently without sequelae. It is quite likely that such cases are due to edema alone. On the other hand, the symptoms may be so transient as to barely attract attention—a slight momentary cyanosis or failure to nurse well for one or two periods. No further symptoms occur, and yet, when the child begins to walk, we find that it is a spastic, and probably a feeble-minded child.

What is the etiology of this whole condition? As has already been stated, Rodda found that it is associated with a prolonged clotting time, but this demonstrated no real etiology, since the blood of the infant at the moment of birth is practically identical with the blood of the mother, and yet the infant shows a prolonged clotting time, while the mother's blood is not so affected. These observations left us somewhat in the dark, and only quite recently has he made another and still more striking observation (as yet unpublished, and comes to me as a personal communication) and that is that prolonged clotting time is frequently, if not always, associated with some degree of asphyxia. If this is true, it will account for the incidence of the disease to a certain extent, and tends to explain the variation in the time of onset of symptoms.

Let us glance just for a moment at the treatment of the symptoms as they arise. It is advocated by some observers that lumbar puncture is the rational treatment. Does lumbar puncture accomplish anything or not? In the cases due to edema alone it is reasonable to suppose that lumbar puncture frequently repeated may keep the intracranial pressure below the dangerous point until the edema subsides, and may in consequence tide the patient over this critical period. Lumbar puncture in the presence of traumatic hemorrhage does not appear to me to be rational, nor can we diagnose the condition from lumbar puncture alone unless the hemorrhage is subtentorial, in which case alone blood appears in the spinal fluid. Therefore, it is essential that we treat the cause of the condition rather than the symptom.

The treatment of delayed clotting time is the administration of whole blood as soon as any symptoms are noted. In the absence of facilities for testing the clotting time when either cyanosis, or convulsions, or twitchings, or inability to nurse appear, whole blood should be administered at once. Whole blood can be given at this age without typing, because infants under a month as a rule possess practically no hemolyzing action to adult blood.

In the light of our newer knowledge, prevention is of course the main indication. All infants should have the blood clotting time tested within the first few hours of life and again during the third or fourth twenty-four hours. Any clotting time above ten minutes with or without symptoms calls for an immediate injection subcutaneously of whole human blood. If the clotting time is delayed and the patient is given blood, the clotting time should then be tested every six hours and blood administered until the clotting time comes below ten minutes and remains so. In the light of our knowledge on this subject, it seems to me imperative that all physicians presiding at the birth of an infant should exercise prophylactic caution, and practice universally the testing of the clotting time. Thus, and only thus, can we prevent many deaths which now occur and are preventable, but we can do something more—we can prevent something that is worse than death, the feeble-minded spastic of later life.

The technic of the Rodda method of testing blood clotting time is as follows: two watch crystals, one and one-half inches in diameter; a lancet, either of the spring set variety or a plain small knife; and number six lead shot are all the equipment that is needed. The crystals and shot and lancet must all be surgically clean. The heel of the infant is wiped off with alcohol and ether, a good free stab wound is made (from 3 to 5 mm. deep). No squeezing of the heel or wiping of the drop of blood should be permitted. The first drop is discarded, but from the moment that it drops the time is taken on the second drop, which is allowed to fall in the watch crystal on the shot. The other crystal is placed over this to prevent the influence of the atmosphere or dust. The crystals are then set on a table and tilted every thirty seconds until the shot remains firmly enmeshed in the clot. Time is then taken. Anything below ten minutes is considered normal clotting time.

Two cases briefly cited serve to illustrate the difference between traumatic hemorrhage and that due to the hemorrhagic disease of the newly born. One infant born in the Univer-

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sity of Virginia Hospital as a breech presentation with difficult delivery of the after-coming head showed symptoms of intracranial pressure immediately after birth, and died within twenty-four hours of respiratory failure accompanied by cyanosis. The clotting time of this infant was four and one-half minutes; autopsy showed a diffuse hemorrhage over both hemispheres with laceration of the longitudinal sinus.

The other was likewise born in the University of Virginia Hospital after an easy labor with vertex presentation. In this instance the cord was wrapped twice around the neck and in addition there was a knot in the cord. The infant was cyanosed when born, and was resuscitated with great difficulty; in fact, was never entirely free from the cyanosis. The clotting time of this infant was nineteen minutes. Whole blood was given, but it died with respiratory failure within twenty-four hours. Autopsy revealed a single clot, thin but extending over a greater portion of one hemisphere and adherent to the membranes. In all probability this hemorrhage occurred before birth, and it is likely it was due to asphyxia from the cord dystociae.

DISCUSSION.

DR. W. P. MCDOWELL, *Norfolk*: In addition to the cerebral condition, as presented by Dr. Royster in his interesting paper, there is another danger in connection with hemorrhagic diseases of the new born to which I wish to call your attention. That is the constant practice, by so many physicians, of performing circumcision in the first few days of life.

I wish to emphasize this danger and to sound a warning against this practice. Only recently, in one of our local hospitals, on the second day of life an infant was circumcised, following which there was a continuous and rather profuse oozing, so much so that the patient was almost exsanguinated. The attending physician was preparing to use actual cautery in an attempt to stop the bleeding, when one of the surgeons appeared and cautioned against this, advising instead the giving of an intramuscular injection of whole blood. The mother was eclamptic and her blood was not thought suitable, so the physician acted as donor. 20 c.c. of whole blood was given intramuscularly and the oozing was soon stopped. There is no need of this early method, and every reason for a postponement until after the tenth day. Rodda has shown that there is a prolongation of coagulation and bleeding time from the first to the maximum on the fifth day of life, with a return to the average first day's determination before the tenth day. The Rodda method of determining the clotting time is a very simple method, easily carried out at the bedside.

I would ask Dr. Royster to describe the method in closing the discussion. We are due Dr. Royster a vote of thanks for the interesting paper.

DR. LEROY A. CALKINS, *University*: This paper and the work preceding it relieve the obstetrician of a great deal of responsibility and at the same time add responsibility to his work. It relieves him in that the blame of sudden death in very young babies is placed on the faulty coagulation of the blood and not on birth injuries, but it adds responsibility to his work in that it makes it necessary for the obstetrician, if he does not consult the pediatrician, to test the coagulation time of the baby immediately after birth.

An interesting case of prolonged coagulation time, present at birth, came under my observation two and one-half years ago. We took the coagulation time of the blood at birth for the reason that the baby showed embarrassed respiration. There was no spasticity or other sign. We felt the probability of hemorrhage near the respiratory center at the base of the brain. The clotting time was found to be twenty-two minutes; the bleeding time twenty-four minutes. Blood injection was done immediately, and the clotting and bleeding time came down to normal and remained there. The child is now two and one-half years old and there are no signs of embarrassment of the nervous or muscular mechanism and no impairment of mentality.

My opinion differs from that expressed in the previous discussion as to the bleeding time of the baby and the mother being the same at the time of birth. It was my good fortune to take the bleeding time of both mothers and babies at birth, in Rodda's first series of cases, and I usually found the mother's bleeding time three to five minutes. Those babies who later developed a longer time I found six, seven, eight, or even nine or ten minutes at birth. Nearly all were within ten minutes at birth, but there was some degree of prolongation in those cases which later developed long bleeding time.

DR. R. M. HOOVER, *Roanoke*: I listened to Dr. Royster's paper with the greatest interest, because, in orthopedic work, some of the most troublesome cases are those which are spastic to varying degrees. It seems to me that Dr. Royster has made a wonderful suggestion as to prevention. Unfortunately, there is very little hope in after treatment at the present time, in those cases in which mentality is markedly impaired. In such cases any treatment of the local conditions of the extremities is not thought advisable, and if, by trying the coagulation time at birth, we can prevent at least a certain percentage, we have done a lot. In Virginia, as everywhere, we find a surprising number of these spastic cases, either mild or marked, and if we can prevent a percentage of these we will have done a great deal for humanity.

DR. S. B. NICKELS, *Clinchport*: I would like to ask Dr. Royster how much mother's milk he injects, and if he has ever noticed any reaction.

DR. L. T. ROYSTER, *University*, closing discussion: As to the clotting time of mother and child, in cases of hemorrhagic disease, it is not the same at the birth of the child.

Twenty-five c.c. of mother's blood should be injected if you can get it. Get anybody's blood: it makes no difference. Any amount will do some good, but twenty-five c.c. should be given if possible. The clotting time should be checked up by frequent tests, and if it does not improve, repeat the injection.

The method of Rodda is as follows: Take two watch crystals, cleaned with soap, alcohol, and ether, and a No. 6 shot, which has been cleaned in the same manner. The shot should be handled, if possible, with forceps, to prevent soiling or greasing by

contact with the fingers. Cleanse the heel and make a puncture wound deep enough to allow two drops of blood to drop freely, without pressure or manipulation. The first drop is discarded entirely, and the second used. Count your coagulation time from the instant the first drop falls. Put the second drop on the shot in the watch glass and cover it. Tilt it every thirty seconds until the shot is enmeshed in the clot, and read the time.

TREATMENT OF DUODENAL ULCERS.*

By STUART McGUIRE, M. D., Richmond, Va.

Gastric and duodenal ulcers may be acute or chronic. Acute ulcers are usually multiple. They develop rapidly and usually heal rapidly. They are most frequently the result of some severe infection or grave toxemia, and are not often diagnosed unless they cause hemorrhage or perforation as the symptoms they produce are usually attributed by the attendant to the primary disease. A chronic ulcer may result from an acute ulcer which fails to heal, or may develop and persist from causes for which we have many theories but no definite explanation. This paper deals only with chronic ulcers.

It was formerly taught that gastric ulcers were frequent and that their diagnosis was easy, while duodenal ulcers were rare and their diagnosis was difficult. The modern surgeon and roentgenologist have proved that just the reverse is true. Gastric ulcers are only one-fourth as frequent as duodenal ulcers and their diagnosis is attended by a much greater chance of error.

Occasionally in medical writings it is a practice to use the word "peptic ulcer" and under this term describe the symptoms and treatment of both gastric and duodenal ulcers. This is unfortunate, as anatomically and pathologically they are distinct and the indications for their treatment are very different.

The pyloric vein and the pyloric white line mark the division between the stomach and duodenum, and on inspection it is usually easy to locate the origin of an ulcer and to designate it as gastric or duodenal. A gastric ulcer is rarely within an inch and a half of the pylorus and a duodenal ulcer almost always begins one-half inch or more from this landmark, although by extension it may actually reach the stomach.

A gastric ulcer develops in an acid field, and for this or some other reason has a strong tendency to undergo malignant degeneration, while a duodenal ulcer grows in an alkaline soil and rarely, if ever, develops into cancer. A gastric ulcer should be regarded as a potential cancer, and should be removed surgically as soon as discovered, while a duodenal ulcer should be considered a benign lesion and should first be treated medically unless there are indications of danger to the life of the patient from hemorrhage, perforation, or obstruction.

While it is true that the symptoms of ulcer of the stomach and duodenum have so much in common that we frequently speak of an "ulcer history," it is a fact that they differ strikingly in certain respects, and that a differential diagnosis can usually be made with reasonable certainty on the clinical history alone. The symptoms of both gastric and duodenal ulcers are indigestion, pain, vomiting and hemorrhage, but the characteristic symptom is pain. In gastric ulcer the pain comes on shortly after a meal, gradually subsides and is reproduced by taking food. In doudenal ulcer the pain does not come on until three or four hours after a meal, and is completely and immediately relieved by taking food. Patients with ulcer of the stomach dread taking food, while patients with ulcer of the duodenum soon learn to keep a biscuit or glass of milk easily accessible in order to arrest the so-called hunger pain when it develops.

The presence of blood in either vomitus or feces is significant but not conclusive of the existence of an ulcer. An analysis of cases in which such bleeding occurred showed that from two per cent to four per cent were due to gall-bladder disease, one to two per cent to chronic appendicitis, and a smaller proportion to cirrhosis of the liver, splenic anemia, hemophilia and purpura.

The analysis of the stomach contents after a test meal once so largely relied on as a means of diagnosis has been largely discredited. It is true that twenty per cent of cases of gastric ulcer and seventy-two per cent of duodenal ulcer show hyperchlorhydria, but this condition is also common to other diseases.

The subjective symptoms of duodenal ulcer are so definite and clear cut that a diagnosis can be made with reasonable certainty from the patient's clinical history alone. It is very different with gastric ulcer, for here the symptoms are frequently misleading. This fact is expressed by Moynihan with characteristic felicity in a recent lecture in the following words: "I may perhaps sum up my experience in the clinical diagnosis of these two condi-

*Read at the fifty-fifth annual meeting of the Medical Society of Virginia, in Staunton, October 14-17, 1924.

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tions by saying that when with great confidence I make the diagnosis of duodenal ulcer from the clinical history alone, I feel wounded and amazed if I prove wrong; whereas, when with a sense of pride in my courage I make the diagnosis of gastric ulcer I feel very content, even a little elated, if I prove right."

Fortunately in the modern method of X-ray examinations of the stomach and duodenum, we have a means of securing information of great diagnostic value. In duodenal ulcers the lesions can be shown by obstruction or deformity of the bulb, and in gastric ulcers by niches, notches, craters, or an abiding spasm of a zone of the stomach. Sometimes the findings are misleading because when they are positive the condition may be due to other causes, and when negative they may be due to failure of the ulcer to produce deformity.

In estimating the value of an X-ray report, the personal equation of the roentgenologist must always be considered. Today X-ray machines are being installed in almost every hamlet and village in the country, and enthusiastic but inexperienced operators, who have learned the jargon, but not the technique of their profession, are turning out scientifically worded, but weird and woolly, reports. Almost any technician can make a good plate but it takes a highly trained expert to read one properly and make a correct diagnosis from what it shows. Experience has taught that an unreliable roentgenologist is a dangerous friend, and that in certain instances in making a diagnosis it is better for a time to discard the X-ray report and depend on the patient's symptoms and clinical history.

As previously stated, the indications for the treatment of gastric and duodenal ulcers are so different that the two should not be considered together. For lack of time to take them up separately, the remainder of this paper will be devoted to the discussion of the treatment of chronic duodenal ulcers.

The first question in a given case is whether the treatment shall be medical or surgical. Shall the patient be given the medical treatment standardized by Sippy which consists essentially of rest in bed, a restricted diet and the neutralization of the stomach contents by the administration of alkalies, or shall the abdomen be opened by the surgeon and the ulcer excised or a posterior gastroenterostomy performed? On this subject there has waged a vigorous and almost disgraceful controversy. Surely this is due to lack of understanding, because no reputable physician would treat a patient unless he thought there was a reasonable chance of relieving him, and no conscientious surgeon would operate on a patient if he believed a cure could be effected by less heroic measures. Physicians and surgeons are equally honest and intelligent, and when they differ so decidedly there must be a happy middle ground on which both will eventually unite.

The explanation of the present situation is the fact that physicians treat patients with duodenal ulcers in the early stages of the disease, and see them relieved of their symptoms and apparently restored to health. They are usually ignorant of the relapses that occur. Surgeons deal with patients who have suffered from duodenal ulcers for years and have been treated by many physicians without permanent relief. They are, therefore, impressed with medical failure and unmindful of medical cures.

After all, the question is academic, as no patient will submit to an operation until he has first tried medical treatment, and no patient will continue medical treatment indefinitely but will eventually go to a surgeon if he fails to secure relief.

Personally, I never advise an operation until after the patient has been properly treated medically without success unless the symptoms point to the dangers of hemorrhage or perforation. I always tell the patient of the necessity of hearty co-operation with the physician and warn him of the patience and self-denial which must be practiced in order to secure the desired results. I believe medical treatment would be more successful than it is today if the profession would unite in urging patients to continue it faithfully over a longer period of time.

The surgical treatment of ulcers of the duodenum is indicated in three conditions: (1) hemorrhage; (2) perforation; and (3) persistence of symptoms despite painstaking and prolonged medical treatment.

In cases of hemorrhage an immediate operation is rarely advisable. The vast majority of patients will have a better chance for life if they are first treated by absolute rest, the prohibition of food, the administration of horse serum or the transfusion of blood. After bleeding ceases and the general condition improves, an operation should be done to prevent a recurrence of the symptom.

In cases of perforation an operation should be done as soon as the diagnosis is made. Sometimes it is sufficient to simply close the opening. If this constricts the outlet of the stomach it should be augmented by a gastroenterostomy. Some surgeons advise the latter as a routine procedure.

In cases where medical treatment has failed, surgical treatment is indicated to relieve symptoms and restore health. In rare cases it is possible to simply excise the ulcer and close the incision in such a manner as to avoid obstruction of the duodenum. This can only be done when there is a single small ulcer located on the anterior wall of the bowel at some distance from the pylorus.

Usually the surgeon has to choose between some form of pyloroplasty or gastroenterostomy. Each method has it advantages and disadvantages, both have their special field of usefulness, and neither should be employed to the exclusion of the other.

The operation of pyloroplasty was introduced by Mikulicz and consists in dividing the pylorus by an incision in the horizontal axis of the gut and suturing the incision at right angles to the line in which it was made. This permits the excision of the ulcer and overcomes any obstruction at the pylorus by enlarging the outlet of the stomach. Finney adopted the principle of Mikulicz, but in his operation divides the pylorus by a horse-shoe incision, one arm extending down the duodenum and the other along the greater curvature of the stomach. Horsley has recently so changed and perfected Mikulicz's operation that he has practically introduced a new procedure, and his technique promises to find favor with many surgeons.

The operation of pyloroplasty can only be satisfactorily performed for duodenal ulcer when the lesion is located near the pylorus and when the adjacent bowel wall is comparatively normal. If the ulcer is more than three-fourths of an inch from the pylorus it cannot be excised, and if the tissues are thick and inelastic they cannot be approximated in the desired position without producing deformity and they cannot be sutured without danger of leakage. Horsley who advocated the operation states that it cannot be performed in twenty-five per cent of cases, while Deaver and others place the percentage much higher.

The advantages claimed for pyloroplasty are that it places the outlet of the stomach in its anatomical and physiological position, that it enables the surgeon to excise the ulcer area, and that patients do not suffer afterwards from the vomiting due to regurgitation of bile and are not liable to the danger of a secondary ulcer from the action of gastric juices on jejunal mucous membrane.

The disadvantages of a pyloroplasty are that the incision is made through septic and ulcerating tissue which may cause local or general infection, that the incision is made through scar tissue which may contract and cause obstruction and that the incision is so located that it may become adherent to the liver or abdominal wall and cause interference with the movements of the stomach.

During the past year I have done pyloroplasties by Horsley's method on six carefully selected cases. The operation proved easy of execution and there were no mortalities. Despite satisfactory convalescences, none of these patients expressed the enthusiastic appreciation of the relief given them to which I was accustomed from my experiences in similar cases in which I had done gastroenterostomies. There has not been time to learn the final result in these cases. Those I have traced have continued to improve. I trust my temporary disappointment will be justified by the patient's freedom from complication and ultimate cure.

The operation of posterior gastroenterostomy for duodenal ulcer consists in an effort to sidetrack the diseased area by making an anastomosis between the stomach and jejunum. The method is applicable practically to all cases. It is easy and safe in execution because the tissues in the field of operation are normal. Its effect on the stomach is both mechanical and chemical. Mechanically it permits the gastric contents to pass readily into the intestines as the new opening between the stomach and jejunum relieves any obstruction that may have existed at the pylorus. Chemically it lowers the acidity of the gastric contents, as the stoma also permits the alkaline secretions of the liver and pancreas to pass into the stomach. Thus, gastric dilatation and food stagnation are cured by drainage, and the hyperacidity of the stomach is relieved by neutralization of the acid with the patient's own alkali.

The objections offered to the operation of gastroenterostomy are that sometimes food escapes too quickly from the stomach, causing bowel disturbances, that occasionally bile and

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pancreatic secretion enter the stomach in large quantities, causing nausea and vomiting or the so-called vicious circle, and finally, that in a few cases an ulcer develops in the jejunum, at or near the the anastomosis, due to the irritation of a mucous surface which has no natural immunity to the action of gastric juices. This complication can be made infrequent by placing the opening at the bottom of the stomach so there will be no retention, and by using catgut instead of silk or linen so there will be no unabsorbable sutures left as a possible source of irritation.

While the operation of gastroenterostomy undoubtedly requires explanation and apology, still it gives complete relief in eighty per cent of properly selected cases, and I believe will continue to be employed by many surgeons until some better operation than those now in use has been devised.

DISCUSSION.

DR. J. SHELTON HORSLEY, *Richmond*: I feel about the surgical treatment of duodenal ulcer much as Dr. Stuart McGuire does. I do not think that any one operation can be made to fit all cases. When the ulcer is extensive or when there are many adhesions, or if there is marked constriction, a posterior gastroenterostomy is undoubtedly the best operation. If, however, the ulcer is not large and is circumscribed, and particularly if it is bleeding, a pyloroplasty such as I have been doing for several years is a very satisfactory operation. The more extensive the pathology the greater the indication for gastroenterostomy, and the less the pathology the stronger the indication for pyloroplasty. A posterior gastroenterostomy with an open pylorus is very likely to give trouble. When the pylorus is closed or when there is a potential closure because of the extensive ulcerated condition, the alkalinity of the duodenal contents is not affected and can protect the jejunum at the gastroenterostomy stoma. When, however, the duodenum and pylorus are left open the alkalinity of the duodenal contents is lowered by the acid gastric juice which gains exit through the pylorus, and, consequently, the duodenal contents are weak in alkalinity and cannot protect the jejunal mucosa from the acid gastric juice going through the gastroenterostomy opening. In such cases, either a jejunal ulcer or jejunal irritation is likely to result.

When the ulcer in the duodenum is more than an inch from the pylorus, I think it should be excised transversely and sutured, probably without any operation upon the stomach at all. I do not feel that there is any place for radical resection of the stomach for the cure of duodenal ulcer. An ulcer in the stomach, of course, demands excision and probably partial gastrectomy.

It seems to be demonstrated that the gastrin that Edkins brought forward about fifteen years ago as acting as a hormone elaborated by the pyloric mucosa to stimulate the activity of the rest of the stomach does not really exist as a specific substance. A similar so-called hormone may be found in meat and various vegetable and animal matters and is rather constant in the ordinary mixed diet. There can be no occasion, then, for excising the pyloric mucosa which normally secretes alkaline material in order to do away with the supposed stimulating hormone which physiologists have shown is not secreted by the pyloric mucosa.

About forty to fifty per cent of the duodenal ulcers in my practice are operated upon by pyloroplasty. In most of the other cases a posterior gastroenterostomy is done. In a very few there is simple excision. As a rule, when I do a gastroenterostomy the pylorus is ligated just tightly enough to occlude it with stout kangaroo tendon. This gives rest to the duodenal ulcer and promotes healing. In a letter from Dr. Charles Mayo, under date of June 25, 1924, he says, as follows: "At the present time in nearly forty per cent of our cases of ulcer of the duodenum we are trying to confine the work to the pylorus and region of the ulcer instead of making a gastroenterostomy." A careful follow-up of cases of duodenal ulcers that have been operated upon seems to demonstrate to my mind that the operation must be suited to the particular case. If properly done the mortality should be very low. I have done sixty-four of the pyloroplasties according to the method I have described. All the mortality was in the first twelve, and I think if I had these patients to operate upon again for a similar condition they doubtless would not die. In the last fifty-one consecutive pyloroplasties there has been no mortality.

I find that the chief objection to pyloroplasty is that there is occasional recurrence of the ulcer. Dragstedt has called attention to the fact that injury or multiple sutures in the pyloric mucosa will often produce an experimental peptic ulcer in a dog. For the last six months I have omitted suturing the gastric mucosa, merely catching the muscular and peritoneal coats and trying to avoid even grasping the pyloric mucosa with forceps. The first suture line unites the muscle and peritoneum of the pylorus and when the duodenum is reached the whole thickness of the duodenal wall is included, as it is impossible to isolate the duodenal mucosa without too much trauma. The flap of pyloric mucosa probably protects the line of sutures through the duodenum.

A CHEAP PERMANENT, SANITARY TOILET FOR RURAL DISTRICTS.*

By B. B. BAGBY, M. D., Richmond, Va.

For fifteen years the physicians of Virginia have known that hookworm is due entirely to soil pollution; for twenty years we have been taught that cholera infantum and infectious dysentery in the country are due to fly infection from the insanitary privy; while for nearly a generation we have known that typhoid fever is only contracted by eating or drinking human excreta. Moses, 4,000 years ago, for reasons of health, commanded the Children of Israel to cover up their feces (Deut. 23rd Chap., 12-14 v.), yet there are many members of this Society that still have excreta disposal arrangements of their own that are not fly proof, and others have tenant houses that have no toilet whatsoever, and this, in the face of the fact that the sanitary condition of no community

*Read at the fifty-fifth annual meeting of the Medical Society of Virginia, in Staunton, October 14-17, 1924.

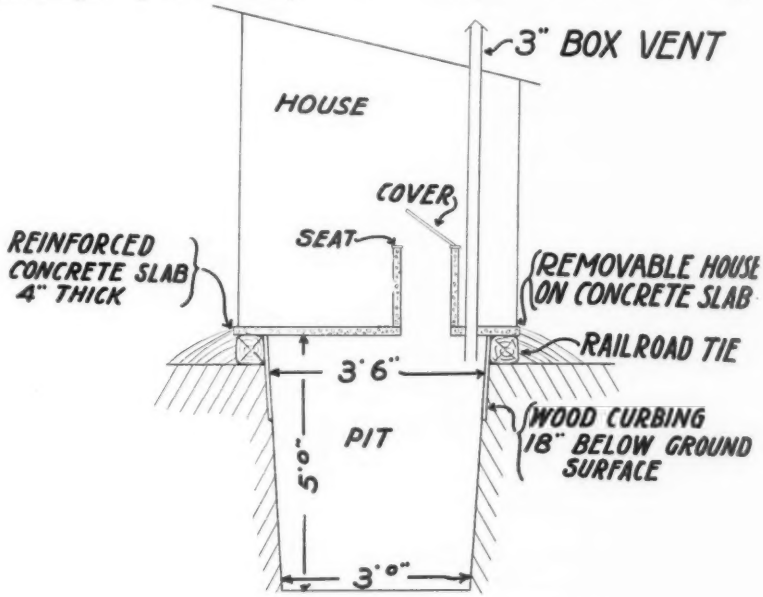
will ever be better than the homes of the physicians in that community.

There is not a county in Eastern Virginia that does not spend every year more money for the cure of these diseases alone than it will cost to sanitate every home in the county. Of course, the anxiety and suffering cannot be estimated in dollars and cents. I do not have to remind you that it is the physician's duty to reduce the sum total of distress.

Many people, physicians among them, however, unintentionally set a bad example of home sanitation; privies go to pieces so easily. The fact that it is now almost impossible to obtain satisfactory heart lumber in the rural communities is a serious difficulty, for if privies are built out of sap lumber they will scarcely remain fly proof one season.

This difficulty is being solved. In Henrico County we are building a very satisfactory sanitary toilet that is cheap and durable. It is a regular pit privy with concrete floor and seat. Any old house can be used over this concrete slab. The protection is under the concrete seat and not in the house. Any jack-leg mechanic who can mix concrete can build this privy. All that is required is two bags of cement, four pieces of two by four framing timber four feet and two inches long for the outside forms for the slab; for a platform some old lumber on which the concrete is poured; a nail keg for the inside form for the seat; a lime barrel with the bottom knocked out sawed off four inches shorter than the nail keg for the outside form of the seat. Some wire or iron is needed for reinforcement. As the cement is poured between the nail keg and lime barrel, three long bolts with heads down and screws up are imbedded in the cement, these bolts are set so as to pass through the seat to hold it stationary. A pint tomato can should also be used to make a hole in the cement slab for a vent pipe.

The pit should then be dug and enough



SECTION OF SANITARY PIT PRIVY

boards put in to keep it from caving, just as is done in any pit privy. But great care should be made to have a strong foundation on which the concrete slab is to rest. This is easily made by placing on two sides of the hole old railroad ties, a half of a tie on each of the other two sides. This allows the two long ties to project about two feet beyond the hole on each side. Of course, the dirt from the hole should be packed tightly on the outside of the ties.

A good tight fitting top to the seat should be made and copper wire screening should be put over the vent pipe. A slab four feet square will cover a pit large enough to hold the excrement of a family of four for a long time. If there are more in the family a larger pit covered by two slabs three by six feet should

be dug, the slabs being placed side by side over the pit. If water gets into the pit the excrement will disintegrate rapidly and be taken up by the surrounding earth as in a cesspool. If the material in the hole is not too moist it can be burnt by pouring in a gallon of kerosene and setting it afire. This may be done without danger to the building. But if it should fill up, another pit can be dug near the first, both the slab and house being moved over to the second pit, and the first covered with dirt. The farmers of Henrico plant cucumbers over the first hole and sell them to the city people, thus getting back their original small investment.

DISCUSSION.

DR. WALTER COX, *Winchester*: I believe Dr. Bagby's paper is of the greatest importance. It is almost impossible to get the people to appreciate any kind of sanitation, and it is equally impossible to get the support in this work of the board of supervisors. We have been having typhoid, forty or fifty cases in Frederick County, more this year than ever. As health officer of Winchester, I mentioned some necessary sanitation measures to one of the commissioners. He dismissed the subject with the remark that there was a new call for money every day, and that the people might as well die of fever as starve to death.

THE ORIGIN AND EVOLUTION OF THE ATTRIBUTES OF MAN. THE SOUL AS A WORD THOUGHT. MAN'S SPIRIT AND THE COSMIC PROCESS.*

By CHARLES E. BOWLES, M. D., Pulaski, Va.

THE ORIGIN AND EVOLUTION OF THE ATTRIBUTES OF MAN

In approaching a subject of such magnitude and deep concern to the human race, I do so with a fervent desire to arrive at the cause and effect of the many attributes to which mankind is heir and offer my feeble suggestions as an aid in arriving at more definite conclusions.

At our last meeting I attempted to show in a concise way, that the protoplasmic cell was developed from a gradual blending of the inorganic chemical elements, one into the other, and that the reaction occurred as a result of a definite form of energy or group of electrons being absorbed by the atoms of the cell. I further attempted to show that these ions are what we know as energy and that when they are appropriated by the atoms composing the brain cells, they constitute the sensations or materials for intellect. The grouping of these ions or sensations in other cells results in more and more complex atoms or perceptions, conceptions, complex conceptions, etc., being formed, and in the molecules of the cells becoming more and more complex, until a new element is formed and a distinct chemical reaction occurs, which results in a higher type of tissue.

The thoughts in this class of cases appear to be purely chemical, organic, animal or transitional, and result only in reactions, reflexes, tropisms, muscular acts and a higher development of the cell. In this paper I shall continue the discussion and endeavor to show three distinct stages in the evolution of thought: Molecular, atomic and electronic, each passing through a transitional stage, while commingling and co-operating with the other and developing in accordance to the three great laws, attraction and repulsion, chemical valency, and complexity.

First, let us consider the relationship existing between the ions or sensations and that which we know as life. Huxley said that plasm is the basis of organic life, but since this is simply a chemical compound of carbon, we must search further for that which accomplishes the real processes of life. In its simplest form, the living cell is merely a soft globule of plasm, containing a firmer nucleus. The body and nucleus differ somewhat in chemical composition but both are composed of carbon, hydrogen, oxygen, nitrogen and sulphur. The reaction in the cell is produced by a stimulus or sensation from the outside world, or, as Dr. Blackford quoting Dastre, at our last meeting, so well put it, "Every vital manifestation is a response to a stimulus, a provoked phenomenon." The reaction in the cell consists of two phases, appropriating and eliminating. The appropriating phase attracts the cell and object while the eliminating phase repels the cell and object. This clearly demonstrates the action of these three great laws. The magnetic law of attraction and repulsion produces the chemical valency which results in the law of complexity, and further shows the sense of perception of stimuli, the movements of the plasm, its nutrition, growth and reproduction to be determined by the particular chemical composition of the cell and the type of stimuli. That which is the real basis of life is not the chemical compounds of carbon, as Huxley said, for this is dormant, but the ions or sensations, which not only produce the reactions in these chemical compounds of carbon or plasm but

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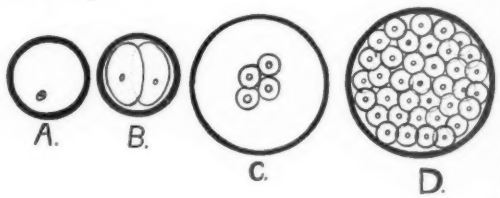
actually produce the chemical elements of which it is composed.

Therefore it is evident, that both the cell and the elements of which it is composed consist merely of groups of these ions or sensations in cellular and molecular forms and that the real life of the compound is the ions or sensations. This fact is clearly demonstrated in the disintegration of the radio-active sub-

A: Human Ovum Undergoing Segmentation.
B: Divided into Two.
C: Divided into Four.
D: Mulberry Mass.



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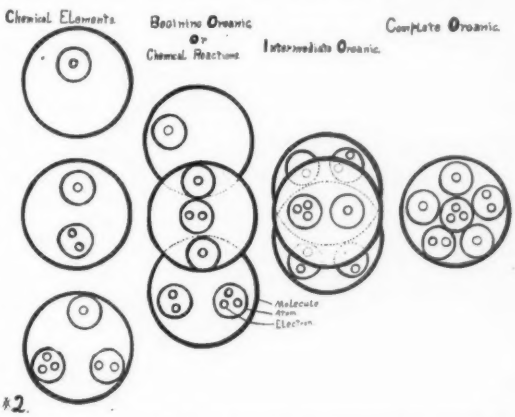
stances, such as uranium. When uranium loses three helium atoms it becomes changed into radium. If we subtract the atomic weight of eight helium atoms, or thirty-two, from the atomic weight of uranium, 238½, we get 206½ which is practically the weight of lead, lead being 207. The slight difference in the calculation is probably due to eliminated or appropriated ions. The disintegration of uranium through four transformations has been traced and it is thought the fifth would result in lead. As a result of the work of Giesel, Becquerel and Villard, the alpha, beta and gamma rays of radium have been separated. The alpha rays were found to be positively charged helium atoms, shot out from the radium with a velocity of from 9,000 to 12,000 miles a second. Later, Madam Curie was able to demonstrate that they were the principal source of the heat emitted by radium. The beta rays were shown to be similar to, or identical with, the cathode rays or negatively charged particles (electrons). The gamma rays were shown to be non-electrified radiations. Unlike the alpha and beta rays, they can not be deflected by a magnet, nor refracted nor reflected, the gamma rays being probably a blending of the alpha and beta rays and therefore neutralized.

Bearing these fundamental facts in mind, let us briefly consider the effect of the ions or sensations on a few types of animals, beginning with the unicellular animal and ending with man. On receiving a positive stimulus, the paramecium reverses its cilia, twists its body and moves ahead. In the sponge, which has no nervous tissue, the individual cells receive their stimulus direct from their surroundings. There does, however, seem to be some slight transmission of impulse near the opening or outlet, which causes it to contract. In the sea-anemones, which is the lowest form of multicellular animal containing an organized nervous structure, we no longer find the cells acting individually but in groups, receiving their stimulus through the more highly developed nervous structure, which is the pre-established hereditary organization. In this animal, the sensations acquired by one side are of no benefit to the other side, for the animal contains no central nervous organ. Each side has a separate organized nervous structure under the control of relay cells.

In this progressive development of the organization and centralization of the sensations under the dominance of one cell, we now come to the vertebrates. Here the spinal cord is a fairly uniform structure, but the brain exhibits a strikingly progressive development. This is especially true in the cerebellum and cerebral hemispheres, both of which grow immensely in size and complexity, as we proceed from the fishes to man. In the lower vertebrates, the sense of smell occupies the chief function of the cerebral hemispheres and, from the predisposed nervous organization of the animal, the



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instincts or multiple group responses to certain stimuli arise. In the mammals, however, the hemispheres have reflected upon them, in addition to olfaction, practically all of the sensory activities of the body and the mechanism of

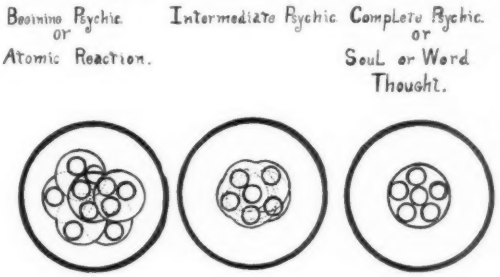
the voluntary control of the nomenclature. These added parts come to be the great central organ of the higher animal and receive almost the whole of the sensory inflow. The nervous structure having apparently developed in consequence of the ions or sensations received and deposited between the cells and later at the end of the new nerve fiber, similar to the tiny tumors we find on the end of cut nerves today. Our sense organs did not develop in consequence of a central nervous system but our central nervous organ probably developed because of the repeated reactions occasioned by the ion or sensations received and deposited at the end of the nerve fibers. It is, therefore, evident that from the bilateral nervous structure of the sea-anemones, there are numerous progressive steps before reaching the central brain cell, in which the two systems become fused under one head. Through the entire process the control of the body cells has gradually been transferred from the individual cell, to the more highly organized and centralized nerve and brain cells, until in the higher mammals we find the various nervous systems conveying their impulses, through the more and more complex centers to the cortical centers, then through the afferent nerve fibers to the association centers, where the supreme blending of the sensations culminates in our personalities. The work of Henchen and other investigators in localizing the cortical centers of the special senses is very pertinent here, since they tend to show the interrelation and organization of the bodily functions under the dominance of one cell. For, as the cortical representations of the macula are found in the occipital lobe and each quadrant of the retina also has a localized cortical representation, so higher co-ordinating and combining centers probably exist in the angular gyri of the parietal lobe, according to these investigators. The realization of word sensations is a further evidence of the necessity of organization, since a word has four principal qualities: it can be seen, heard, spoken, and written. We, therefore, have four groups of word memory cells, visual, auditory, vocal motor and graphic motor. These are connected by afferent and efferent nerve fibers, connecting them together and with the association centers. This illustrates the organization of the special functions, as they combine the individual sensations in a more highly organized cell and forces us to conclude that this progressive organization does not stop until the entire system is dominated by one cell and organized as a whole. We see in this the evolutionary process tending to organization, as it progressively combines the various bodily functions under the dominance of its most highly developed cell—a cell which receives the entire sensory inflow and from which probably emanate those impulses which constitute our volition. Due to the intensity of the reactions in this cell and the extreme complexity of its structure, it has probably long since past beyond the realm of organic and entered the sphere of psychic. (The term psychic is used here to mean word thought).

The Soul as a Word Thought

Herbert Spencer says, "The permanence of that consciousness of differences and likenesses is the warrant for asserting that differences and likenesses exist." He distinguishes between sensations and ideas and says "that out of the process comes the product of the supreme consciousness of object and subject, ego and non-ego."

But in the unicellular animal of the Archeozoic era, thought was necessarily confined to sensations or ions and these, grouping with the atoms of the cell, resulted in molecular thought, ego, and the reactions which caused the cell to appropriate objects to the good of self. Finally, two positive poles or nucleoli developed, which repelled each other and the cell divided into two cells. Here the highest development and characteristics of the cell were conveyed to its offspring. The process continued through the ages, each cell receiving certain characteristics from its parent cell and developing its own peculiar traits as a result of the particular form of energy and elements appropriated. Gradually, it developed through the Proterozoic, Paleozoic and Mesozoic eras into the various tissues and organs of the body, until in the late Genozoic era, or Miocene time, it had developed into the animal man, containing a brain, in which molecular thought, in the supreme ego brain cell, had reached a very high and complex development and over which this most highly developed cell dominated. Sir Ray Lankester calls attention to the fact that in the Miocene time there was a great increase in the size of the brain in several mammal types, and J. A. Thompson says, "This may have implied that differentiation of the rest of the bodily system could not profitably go much further."

We find Cro-Mangan man with a brain developed to the verge of intellect and Paleolithic man displaying a positive intelligence, so that cultural ideas were actually recorded some twenty-five thousand years ago, as found upon the walls of the caverns in the Dordogne region, the Bas Pyrenees and the northern coast of Spain, according to the elaborate



work of LlAbble, Bruel, Osborn and others. Conditions existing at this time are vividly portrayed by H. G. Wells in his brilliant work, "The Outline of History." The sensations, perceptions and conceptions, finally developed the supreme ego brain cell into the highest possible organic tissue, through repeated reactions and appropriation of energy, so that the molecules composing the cell gradually fused into one molecule, just as the various elements in the inorganic compound blended into one protoplasmic cell, and as the transition from inorganic to organic occurred, so now the transition from organic to psychic is accomplished. The reactions in this cell are similar to those of the unicellular animal but on a much higher plane. Here we have only one extremely complex molecule and the reactions are necessarily atomic, while in the unicellular animal, composed of the various elements, the reactions were molecular. Then since the reactions are necessarily atomic, we can only conceive of the gradual blending of the atoms to form atomic, psychic or word thought, as a prerequisite to the state of man. This atomic blending, or atom complex, is probably what Diogenes of Apollonia, called the soul, since it is an extremely complex atom or word thought, comprising sensations, ions or life and is beyond the power of physical death. For, as J. Arthur Thompson says in "Animated Nature," "Unless we have quite mistaken evolution, it implies an emergence of novelties, it is like original thinking." This transition probably first occurred in the Psychocene or present era.

Richard S. Lull, of Yale University, in his lecture, "The Antiquity of Man," quotes Dr. John Lightfoot, a noted authority, as saying, "Man was created on the 26th of October, 4004 B. C. at 9 o'clock in the morning," so I mention this as the possible date of the first occurrence of atomic, psychic or word thought, and the time when man passed through the transitional stage from organic or animal man to atomic or psychic man. From what has been said, it is evident that the soul or atom complex comprises all the sensations, perceptions and conceptions affecting the life of man, from the first sensation of the unicellular animal of the Archeozoic era to the man we know today. It is an atom complex comprising thought, love and life, or sensations blended into word conceptions, that tiny spark of divine presence, reflecting the image of its creator in the mind of man. This is in accord with the Scriptures which says, "In the beginning was the Word and the Word was with God, and the Word was God." (John I, 1).

"So God created man in His own image, male and female created He them." (Gen. I, 27). This psychic, word or soul thought began to assert itself and man became conscious of something he had never known before, the duel personality of man, ego and soul, organic and psychic, and began to discriminate between right and wrong, good and evil, the love of self and a love for others. The realization of this duel personality probably led Shakespeare to give Puck the power of transformation in his "Midsummer Night's Dream," and Stevenson to write "Dr. Jekyl and Mr. Hdye."

We recognize that certain cells of the brain are more highly developed than others and that the variation in development determines the function and character of the cell; that the more highly developed cells dominate the cells of lower type. This fact is very evident in tracing the development of the nervous structure through the sponge, sea-anemones and vertebrates and it is indeed illuminating to find in man the supreme blending of the age long sensations, in the conception of soul.

As to just what part the endocrine system plays in this most intricate mechanism is not definitely settled but its manisfestations are many and varied. Certain hormones certainly

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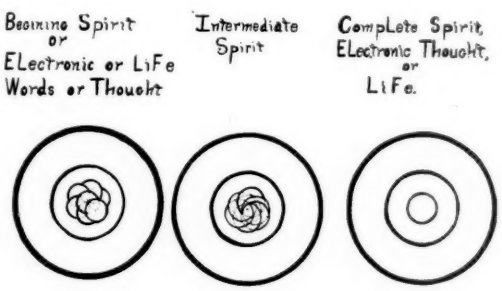
have a profound effect upon the nervous system and consequently upon personality. It is possible that these hormones, circulating through the blood, produce through their influence upon the nervous system, sensitivenesses, idiosyncrasies, or psychological and physiological distaste for certain stimuli, similar to those produced by proteins and thus change the reaction of the body. Certain psychological phenomena seem to have a similar action in producing various mental impressions, but sometimes even combine these psychological phenomena with physiological manifestations, as in fright—a purely psychological impression but invariably accompanied by physiological manisfestations, such as, dilated pupils, digestive disturbances, nausea, vomiting, increased peristalsis, emptying of the bladder, rapid pulse, chill bumps, hair raising and others. Certain chemical combinations produce these effects by stimulating the brain tissue, as very ably and beautifully described by Dr. Wholey in his treatise on morphine habit, in *The Journal of A. M. A.* of August 2nd, the reaction in the brain taking place without the immediate consciousness of the chemical change but with a consciousness of the physiological effect. In the same way, certain external sensations, stimulating a re-grouping of the implanted impressions, may take place without the immediate consciousness of the mental reaction but with a consciousness of the physiological manifestations. The consciousness is directly proportional to the duration and inversely proportional to its intensity, within certain limits, and the positive and negative phases blend at both extremes. In this light, fear may be defined as the reception by the cells of disagreeable or opposing sensations or ions in intensified forms. The reactions resulting stimulate past impressions and our physical acts are governed by a blending of these impressions. The consciousness of the past impressions depends on the duration and intensity of the stimulus. Where these impressions are that of detriment to self, we develop obedience for the good of this self, but where the past impressions are devoid of detrimental execution, we develop defiance by blending the sensations from these impressions. This last phase develops into what we term bravery, exaggerated defiance, or lack of fear. The two conditions may alternate and vary in degree, depending upon the past impressions and type of stimulus.

I have gone into these details because this principle is applicable, not only to fear, but to all the sensations which constitute our volitions. It is true of pleasing and disagreeable sensations; like and dislike; love and hate; each of these being sensations of the same type but of varying degree, duration and intensity. The pleasing sensation of rubbing becomes a painful sensation on scrubbing, love turns to hate, etc. We thus develop the opposite sides of our nature, not only as a result of its chemical composition or predisposed nervous organization but in consequence of the positive and negative ions or sensations received from the outside world. The highest attributes of man, as love, truth, honor, sympathy, knowledge and justice, evolve and are modified from and by the sensations of external origin, stimulating a regrouping of the predisposed impressions. We therefore find that the more frequent the repetition of these qualities, the more prominent this phase of our personality becomes. Our minds, intellect and souls are developed from the sensations. Each word we hear, each thing we see, feel, smell, or taste deposits ions in the brain cells and adds to the complexity of its structure, while developing our personality, but in all instances the elements themselves are those of the primitive sensations.



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The mind of man is never absolutely free but subject to restrictions, which continually recall the chemical background on which it rests. We can not confine ourselves to the physical side alone but must, if we hope for results, investigate the vagueness and inconsistencies of the psychic impressions, for it seems evident that psychic impressions actually produce chemical changes in the body and

these chemical changes are capable of producing psychic impressions. In man, in consequence of his dual personality, ego and soul, these phenomena may be modified in proportion to the development of this cell. The life of molecular thought is dependent upon the life of the chemical compound and its impulses are for the good of self or ego, but in psychic or soul thought we have a different condition. Here the thought consists of ions, energy, or life and is beyond the power of physical death, and its impulses are for the good of others. The love of self has developed into a love for others. The fear which dominated the ego is transformed into a love which dominates the soul. Ernest Haeckel says that every cell in the body and in nature is a soul cell and bases his argument upon a very sound reasoning, supported by known facts developed in paleontology, physiology, embryology, biology and psychology. In his "Riddle of the Universe," he says, "The soul of animal and man are the same, only they vary in degree," but he fails to recognize the importance of this variation in degree. The high degree of complexity involved in the human soul produces a new entity into the physical world, a transformation from molecular to atomic; just as a high degree of complexity in the protoplasmic cell produced a new entity into the organic world, a transformation from inorganic to organic. He traces psychic activities (in the broad sense), as sensations, irritability and reflex actions, from man through the various animals and back to the unicellular radiolaria, and shows the extraordinary power of memory in these tiny cells.

The Yogi philosophy teaches that each cell contains a minature life, which controls its actions and that these lives are really bits of intelligence but these bits of intelligence are subject to the subconscious and conscious mind. The chemical and electrical sides of these facts have already been explained and the experiments of Thedore Flechner and Ernest Weber, of Leipsig, further support the view presented and show that an important part of the mental activities can be measured and expressed in mathematical formulae, just as well as the other physiological processess.

Father Wasmann, in "Modern Biology and the Theory of Evolution," states, "The human soul, being a spiritual entity, can not be derived from matter, even by divine omnipotence;" but it seems clear from the works of Lamark, Huxley, Darwin, Thompson and others, that the evolutionary tendency in the organic realm is progressive and toward a higher complexity or type of cell. The lower organism, devoid of nervous structure, imparts its characteristics to its offspring by dividing its own body, but in the higher mammals, this is accomplished through the nervous system and the generative cells. The generative cells probably receiving the ions or sensations from the entire body through the highest brain cell thus impart the complex ions or characteristics of each cell of the body to the ovum or spermatozoon. The union of these results in an offspring of the same physical and mental type, but having its own particular kind of colloidal substratum and its own peculiar reactions as a result of the blending.

This idea does not conflict with that of Gaston and Weismann but is correlated with it, for as Thompson says, "The germ cells are those cells which carry the whole inheritance without allowing any of it to find expression until appropriate conditions and stimuli are forthcoming." It is also in accord with the Buddhistic Philosophy, for Guatama's idea was that each individual man is the sum of the effects of all the individual aggregates in the chain of migration, or the sum total of all previous fore-parents. H. Drinkwater says, "There is indirect evidence that particular unit characters are represented by the particular particles in the germ plasm, or by ultra microscopic differences of architecture, like the atomic theory in chemistry." During this development, man has gradually risen from the brute to the highly developed, intellectual and ethical citizen of today. But it seems that it was not until the Psychocene era that the entire sensory inflow, received by the highest molecular brain cell, converted it into an atomic complex or living soul. Thus the Lord God formed man of the dust (chemicals) of the ground and breathed into his nostrils the breath of life and he became (not was) a living soul." (Gen. II, 7).

Regardless of the genealogy of man, the fact remains that he is the highest of earth's inhabitants and probably the only thing that possesses a soul. What I have said reveals the continuity of the same processes occurring in all the brain and body cells of animal and man but the stage of development in the individual cells varies from the lowest type of organic to the highest type of psychic. If

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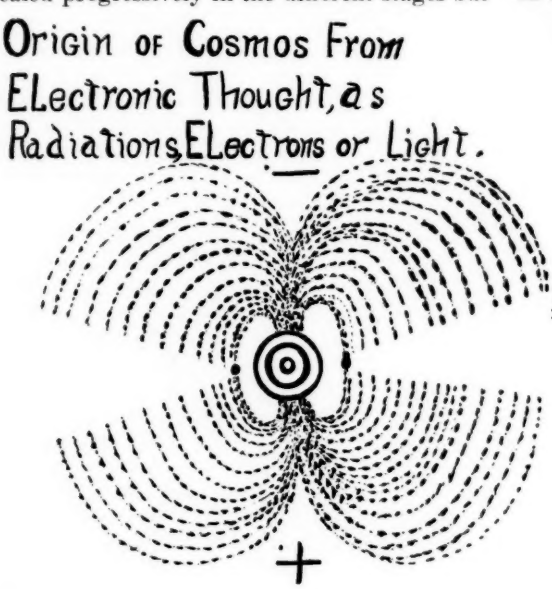
there was a transition from inorganic to organic, then the transition from organic to psychic is obvious.

Man's Spirit and the Cosmic Process

Professor Pringle Patterson said, "The nature of a power at work in any process is only revealed in the process as a whole, it is revealed progressively in the different stages but can not be fully and trully known until the final stage is reached." And the great Russian embryologist, Von Bear said, "The history of nature is nothing but the history of the ever advancing victory of spirit over matter." This phase of the discussion leads us into the realms of metaphysics where our reasoning must be based on known laws of nature, supported by definite results of experimentations and facts of history. So let us follow the same processes, based upon the three great laws, and see the reaction in this highest of human cells, the soul. The psychic or soul complex continues to develop by blending the atoms into each other, until the final transition takes place, when further stimulation results in a blending of the ions or sensations, in forming electronic, spirit or life words. This is in accord with the idea of Jesus, who said, "The words that I speak unto you, they are spirit, and they are life." (John VI, 63).

At this stage of development man may exhibit the characteristics of ego, soul or spirit, depending upon the stage of development and the type of stimuli. This stage compares favorably with H. M. Tichenor's description of the unfolding of the spiritual mind according to the Yogi Philosophy, but as he says, "It seems that cosmic consciousness would be a more appropriate term, since it represents those flashes of illumination, which lift man above his normal self and bring him in touch with the whole of life, make him feel a sense of kinship to all life, high or low, great or small, good or bad." He says, "The most common feeling is that of possessing almost complete knowledge of all things, almost omnipotence, a sense of actual being and of having always been and of our immortality; together with a slipping away of fear."

Darwin expressed the view that the average of a stock can be improved as regards a particular character, by always breeding from those that show most of it; and Professor Pearson and his collaborators have concluded



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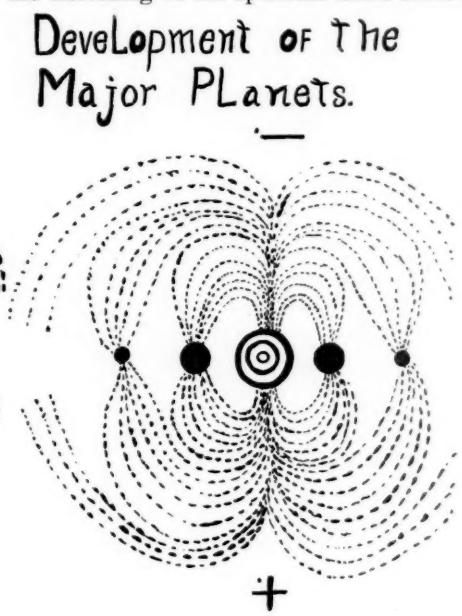

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that "The degree of dependence of the child on the character of its parentage is ten times as great as its degree of dependence on the character of its home." As I have shown, each offspring receives its characteristics and cells of definite composition from its parents and develops its own peculiar traits by appropriating energy and elements, as the process continues through the ages. It is, therefore, evident that the continual union of like minds must eventually result in an offspring of the genus type, and this we find to be true of the Hebrews who, following these laws and clinging tenaciously to the one idea of God, rapidly developed atomic thought or soul, to the point of electronic thought or spirit. We see the flashes of illumination in the writings of the prophets of old and Moses, peeping into the distant past, tells the story of creation, but there is only one character recorded in history who portrays the likeness and characteristics of a fully developed electronic thought, the man, Jesus of Nazareth, in whose virgin mother, the complex sensations or words of soul and spirit, reflected through the nervous system, blended in the ovum to form a new conception, the babe of Bethlehem. "And the word was made flesh and dwelt among us and we beheld his glory." (John I, 14).

Jacob Loeb has demonstrated the chemical fertilization of the eggs of the sea urchin and Leo Loeb the parthenogenic development of eggs in the ovary of the guinea pig. Both of these experiments conclusively demonstrate the possibility of parthenogenesis in man. Man in his mind thus passes through the last transitional stage, in which the psychic thought or word becomes electronic thought or life, and his highest developments complete the cycle and evolve back to the great cosmic consciousness or life of the universe.

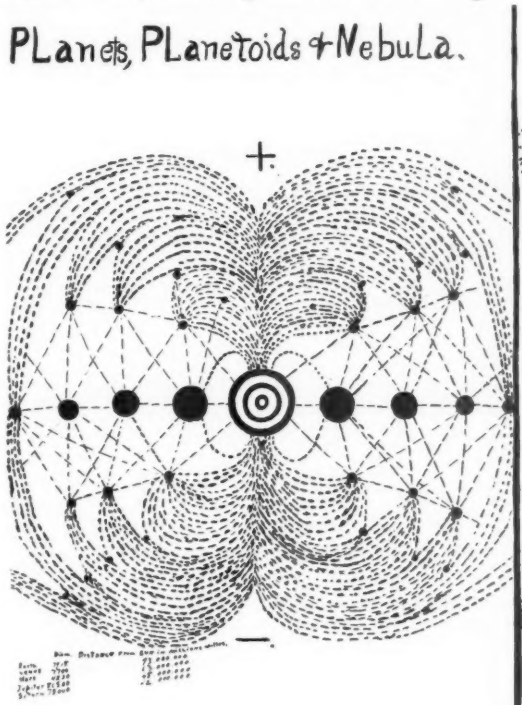


Fig. 7.

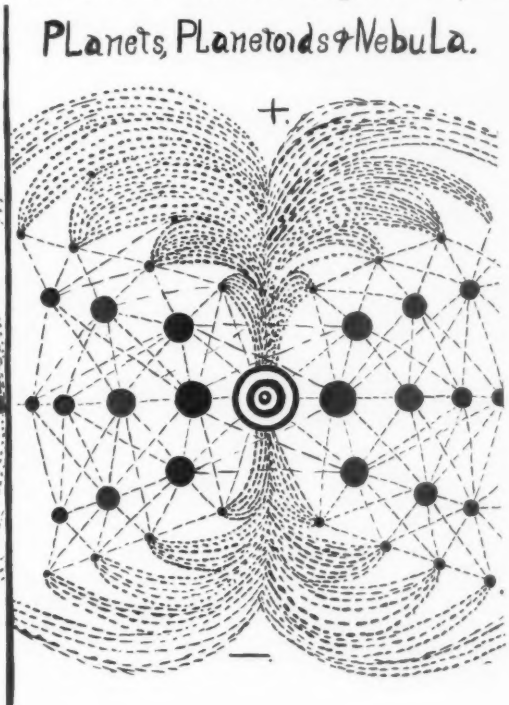


Fig. 8.

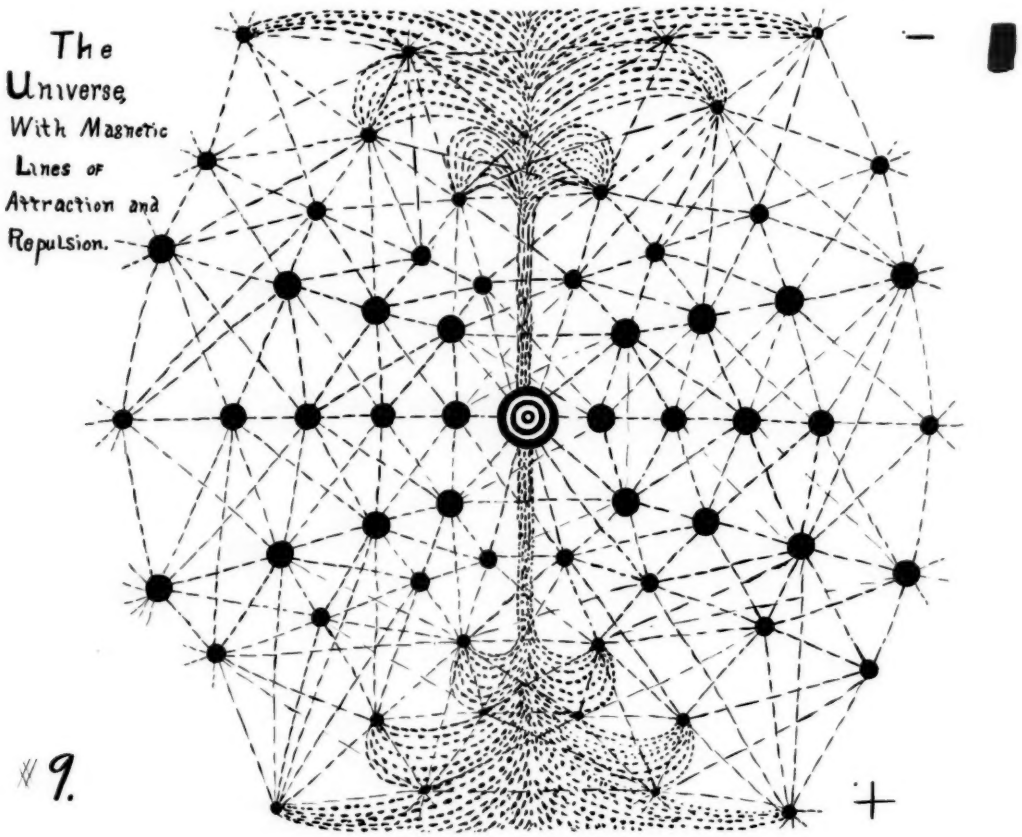
The Brahmin system of philosophy teaches that matter everywhere is permeated with spirit, and matter and spirit are God.

It seems clear from our discussion that all psychic, organic or chemical changes are dependent on the sensations or ions, since they not only cause the reactions but constitute the very elements of which they are composed. It is further evident that without the sensations

there could be no reactions or substance. Therefore, it is obvious that the origin of the cosmos is that which we find to be the highest attribute of man, cosmic consciousness, sensation, love, energy, light, life, word or God.

The great philosopher, Emanuel Kant, conceived matter to have been originally cold and diffused. From a position of rest it began to converge, under the influence of gravitation, to form the sun, from which the other planets were formed. Chamberlin adopts the hypothesis that the accretion was dominantly of dust-like or molecular particles, while LaPlace postulates an original nebula, as a very hot gaseous mass, extending beyond the orbits of the farthest planet and possessing a uniform rotation throughout, as if it were a solid body. As it lost heat, it contracted, leaving successive rings which gathered into the planets.

In the electronic thought of man we come to blend these postulates and realize that the numberless sensations composing the soul of man are all blended into one sensation and that this sensation or word is light, life and God, that which incorporates all opposing, contradictory and incompatible laws and blends them into one and the same thing, life or God. "In him was life and the life was the light of the world." (John I, 4). This panzodic conception of God is not that he embraces all matter or chemicals, but the idea is that he is the sum total of all the ions or sensations from which matter is derived. This idea is rapidly being accepted in regard to all life, that is, that the physical and chemical properties of all matter are determined by the number and arrangement of the positive and negative ions or sensations. Then, since the positive and negative are equal, they probably were originally so blended as to eliminate all force. If this hypothesis is correct, then the ions, words or sensations, being positive and negative, would conform to the magnetic law of attraction and repulsion, by which the ions or electrical



charges of like signs repel each other, while those of unlike signs attract each other. The forces of attraction and repulsion are found like those of gravitation and magnetism to decrease as the square of the distance increases. Applying this to the original ion or sensation, we conceive the radiations of ions or light, as the hot gaseous mass of LaPlace, grouping into the atoms or the diffused matter of Kant, and this into the molecular particles of Chamberlin. Then the reaction of the lighter elements, as hydrogen and oxygen, to form water and the deposit of the heavier ones to form plantules, planetoids, planets and earth, from which has evolved the highly developed physiochemical complex known as man, and in which the chemical elements, through molecular, atomic and electronic blending, evolve back to light and life and thus complete the cosmic process.

A PLEA FOR A MORE GENERAL USE OF DIPHTHERIA TOXIN-ANTITOXIN IN INFANTS AND CHILDREN.*

By T. D. JONES, M. D., Richmond, Va.

The fact that the lowered death rate from diphtheria continued for many years after the introduction of diphtheria antitoxin and then ceased, later actually increasing, indicated that there was a real need for some agent other than antitoxin to confer an active immunity upon the general population. The general use of antitoxin as a means of protection against diphtheria was not practical, because of the short period of immunity which followed its use. Park found that immunity conferred by the injection of antitoxin was only absolute for two or three weeks, and could only be reestablished or prolonged by repeating the injections; but that each later injection conferred an immunity lasting only a week or ten days.

These facts stimulated those interested in the work to look for other agencies as a means to further reduce the mortality from this disease, and led to the attempt to actively immunize man by unaltered diphtheria toxin, or toxin weakened by chemical agents or modified by antitoxin. Roemer was among the first to demonstrate the frequent presence of antitoxin in the blood of normal individuals, and he found that 1/30 unit to each cubic centimeter of blood-serum was sufficient to produce immunity. Further investigations revealed that over fifty per cent of the population possessed this natural immunity. Animal experimentation demonstrated that a considerable percentage of several species of animals also possessed this natural antitoxin and could receive moderately large doses of toxin safely, respond quickly to the toxin stimulus, and make additional large amounts of antitoxin. It was found that newly formed antitoxin could be detected in horses having natural antitoxin within five days after the toxin injection, while in guinea pigs, which never have the natural antitoxin, it took from four to six weeks.

According to Park, the fact that toxin almost neutralized by antitoxin was capable of stimulating the production of antitoxin was accidently discovered. Because antitoxin can only be detected and measured by its characteristic of neutralizing toxin, the degree of neutralization was determined by the injection of a definite amount of the mixture in the guinea pig. This test left a certain portion of these test animals alive, because of their having received subcutaneously toxin which had received an over-neutralizing amount of antitoxin; and the attempts to use these treated guinea pigs several months later revealed the fact that many of them were immune.

In 1905, Theobald Smith made observations on guinea pigs which had received toxin-antitoxin, and published results of further studies two or three years later, discussing the possibility of using toxin-antitoxin in the active immunization of children. Six years later, Von Behring published the first results of the injection of neutralized toxin in a small number of persons. His results were inconclusive, because of the fact that Schick tests were not used before the injection and tests for antitoxin were made too soon after the injection to give any information of value. His real contribution was a demonstration of the safety of the injection in human beings. His example led Hahn shortly afterwards to inject 1,097 school children living in a district where diphtheria was endemic. The Schick test was not made use of in these cases so that the results were not definitely known, but there was no difference in the development of cases of diphtheria in the treated and untreated portions during the first two weeks following the injection, but after that time there was a definite lowering

*Read before the Richmond Academy of Medicine, October 28, 1924.

of the number of cases occurring in the treated portion.

The Schick Test

In 1909 Schick found that if a solution of diphtheria toxin was applied to the skin in the same manner that was used in the Von Pirquet tuberculin test, it produced a reaction in some cases similar to the tuberculin reaction. Following up the knowledge obtained by this experiment, he later developed the intracutaneous injection of toxin as a means of determining immunity.

The method of applying the test consists of the injection of 1/50 of a minimal lethal dose for a guinea pig weighing 250 gms. The injection is usually made on the flexor surface of the forearm. This amount is given in 2/10 c.c. of normal saline. The injection must be made in the skin, or else the toxin will be too rapidly absorbed to give a local reaction. A raised anemic area around the point of puncture indicates that the injection has been made into the skin. If the reaction is positive, a local area of redness and edema, about one to three c.m. in diameter, will appear within twenty-four to forty-eight hours (rarely seventy-two hours) which will increase for three or four days and subside in from seven to ten days, leaving a certain amount of pigmentation. If the individual has as much natural antitoxin as 1/30 unit to 1 c.c. of blood, no reaction will occur and the patient is immune. If the reaction is positive, less than that amount of antitoxin is present, and the patient is susceptible.

Pseudoreactions usually come on more promptly, sometimes in a few minutes. A larger and more poorly defined area is involved, they usually disappear within three days, no pigmentation following.

In 1913, Park began the practical use of toxin-antitoxin injections for the immunizing of children against diphtheria. He established the fact that the procedure was harmless, and that after three injections given from one to two weeks apart, eighty to eighty-five per cent of susceptible children were rendered immune in from one to six months after the injection. In an article published in 1922, he stated that the immunity in at least ninety per cent of the cases was for more than six years and probably for the remainder of life. In a comparison of 90,000 children inoculated and 90,000 controls who received no protection, four times as many cases of diphtheria developed in the control group as among the tested group.

In some ten thousand institutional cases where observations were most accurate for a period of from three to six years, diphtheria did not develop in any child who had received three toxin-antitoxin injections and no serious immediate or late after-effects were observed in spite of the fact that the 3L plus were used in all of these cases instead of the 1/10 L plus doses that are being used at this time. He describes the constitutional and local reactions as negligible in infants, slight and infrequent in the young child, moderate or rather severe in ten per cent of older children, slight, moderate or quite severe in a large percentage of susceptible adults, but states in an article published this year that with the new type of toxin-antitoxin, the local and constitutional reactions have been eliminated and that the immunizing effects of 1/10 L plus doses have been found to be equally as satisfactory.

Park and Zingher are now experimenting with a still newer preparation, toxoid, made by the addition of 1/10 of one per cent formaldehyde to toxin. The immunizing results of this agent compare favorably with toxin-antitoxin and may have some advantages, but the experimenters state in their most recent article that there is no urgency for substituting toxin-antitoxin by toxoid as both the new toxin-antitoxin and toxoid give good immunizing results with but slight local and constitutional reactions.

By use of the Schick test, it has been found that only about fifteen to twenty per cent of infants under six months of age are susceptible. Rugh and McClellan made observations on 100 mothers and their new born babies. All babies were less than seven days old. Ninety-five mothers and babies gave corresponding reactions, twenty being positive and seventy-five negative. In one instance, there was a positive in the mother and negative in the baby. Eight babies giving negative results did not receive breast milk or colostrum. The reporters, therefore, considered that the transmission by the placenta from mother to child of antitoxin bodies was a normal function.

Blum gave 2,000 infants three injections of toxin-antitoxin on the third, eighth and eleventh day after birth. There were no deleterious effects, but at the end of one year he retested 100 of these infants and found that only fifty-two per cent gave negative results.

His conclusions were that the combined effect of immature cells and over-neutralizing of the toxin-antitoxin present prevented any appreciable response to the injections. The highest susceptibility to diphtheria seems to be from six months to three years, being from sixty to seventy per cent, but the highest incidence of diphtheria is from three to five years, at which age only about forty to fifty per cent appear to be susceptible.

Safety of Toxin-Antitoxin Injections.—The antitoxin portion of the combination is more stable than the toxin, so that the sole objection to products kept a long time is that they are somewhat less effective.

The only serious accidents that have occurred, so far as is known, were due to an error through which an improperly tested product was sent out. The present regulations adopted by biological plants make a repetition of such accidents impossible. In February, 1924, students in two institutions in Massachusetts were inoculated with toxin-antitoxin. Forty-four suffered severe reactions afterwards. Investigations revealed that the serum had been subjected to very low temperature and was later thawed out. It was found that freezing disassociated the toxin-antitoxin. More recent investigation by Anderson, Leonard, and others showed that freezing did not increase the toxicity of the newer preparations (1/10 L plus dosage).

Steele, of New Haven, reported a case of serum sickness in the *Journal of the A. M. A.*, April, 1924. It was that of a boy five and one-half years of age. The third injection was given at 3:00 P. M., and a few hours later the child developed noisy, rapid breathing, and a maculo-papular rash, with chill. He was entirely well within three days after the onset of sickness. The 3L plus dose was used in this case.

Park found that a small percentage of children receiving three injections of toxin-antitoxin showed a mild degree of skin hypersensitiveness to subsequent serum injection, but he does not consider that this hypersensitiveness indicates a peril if later serum injections become necessary. He believes that the very small amount of sensitization produced in these cases is negligible.

Conclusions

1. There seems to be no contraindication to the use of toxin-antitoxin. The inoculation of nearly one million children in New York City, and hundreds of thousands in other sections of the country, without any serious effects reported is conclusive of the safety of the procedure.

2. The results obtained indicate the possibility of immunizing the entire population of the country.

3. Its use is not advised in infants under six months of age, although no bad effects result from it.

4. Because of the large number of children of preschool age (under five or six years) who are susceptible to diphtheria, and the difficulties of applying the test at this age, a preliminary Schick test is not advisable.

5. The Schick test, when properly done, is a reliable means of determining the susceptibility to diphtheria.

6. No child receiving three injections of toxin-antitoxin should be considered immune unless a negative Schick test is obtained afterwards.

7. Much can be accomplished by immunizing children of school age, as it is probably through them that the disease is spread. But owing to the high incidence of the disease and the high mortality in children of the preschool age, a large part of the responsibility of immunizing the general population rests with the general practitioner and the pediatrician.

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Medical Arts Building.

SOME CLINICAL MANIFESTATIONS OF PULMONARY TUBERCULOSIS.*

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For the last few years it has been interesting to note the constant decrease in the death rate of tuberculosis throughout the United States. This may be attributed to many factors, some of which are: General health education, the realization of the necessity of personal and industrial hygiene, increasing attention to the health of children, better living and working conditions, and earlier and more accurate diagnosis. In spite of the fact that the mortality in this State is being lowered each year, there continue to be a large number of people who do not seek medical advice until they are hopelessly advanced with the disease and little can be accomplished in the way of treatment. Such conditions are appalling, and it behooves us to analyze the situation and take the necessary steps to minimize its occurrence. This task, however, is by no means an easy one, and many factors must enter into its consideration and successful application. The educational program of the public must go on, the contact and suspect cases must have routine and systematic examinations, and finer points in diagnosis must be emphasized if the morbidity, as well as the mortality, is to be reduced and these people restored to a life of usefulness. No one can be proud of a diagnosis when he is forced to tell the patient that the disease has progressed beyond the point where anything can be done, and that he is doomed to a life of misery and invalidism. On the other hand, if the lesion is slight with only few constitutional manisfestations it is a real pleasure to assure the patient that the chances for recovery are good if he is willing to obey instructions and begin treatment at once.

The prognosis of tuberculosis does not in every case depend upon the extent of the lesion in the lungs. A patient may have an involvement of both upper lobes with a small amount of cavitation and still look and feel well and have no clinical evidence of the disease. Unless there is a marked destruction of the lung tissue, it is the clinical observations, such as temperature, loss of weight, etc., that should guide one in saying how long the period of treatment should be and what the chances are for complete restoration of bodily functions. Many cardinal points come up here for consideration, all of which are important: but time will not permit their discussion. This paper will deal only briefly with early diagnosis, treatment and some factors responsible for relapse, or reactivation of symptoms and signs.

In the diagnosis of this disease in its earliest manifestations there should be a thorough analysis of the following points: (1) A complete history, including symptoms; (2) Physical examination; (3) Laboratory tests; (4) X-ray examination. The history must be gone into thoroughly. This is time-consuming and laborious, but will reveal many important factors bearing on the case and will often be the real means of establishing a diagnosis—"Surely the pen is mightier than the stethoscope if applied properly." Local symptoms, such as pleurisy, hemoptysis, cough, and expectoration, and constitutional manifestations, such as afternoon rise in temperature, loss of weight, night sweats, anorexia, and languor, all have an important bearing. The history of wet pleurisy should always be considered as being due to tuberculosis, until proven otherwise and, from our statistics at Blue Ridge Sanatorium, five to six per cent of admissions have had this. Dry pleurisy, or pain in the chest, when not definitely accompanied by pleural friction rub is of no special diagnostic value and may be the result of some other disease. The presence of rales in the chest, however, is of importance and, when heard, usually means that the patient has tuberculosis. By this is meant moderately coarse rales, heard during inspiration following cough, in one or both apices. When such physical signs are present, the X-ray will invariably show a parenchymatous infiltration of unmistakable origin. The presence of tubercle bacilli in the sputum naturally completes the diagnosis. It might be said here that, regardless of whether other symptoms are present, if the patient has any cough and expectoration, a specimen should always be sent to the laboratory. In most every community there is a hospital or laboratory equipped for doing this kind of work. The State Board of Health will gladly make these examinations gratis and will

*Read by invitation at the meeting of the Alleghany-Bath Counties Medical Society, at Hot Springs, Va., November 14, 1924.

send a container on request. This requires very little time, and certainly the patient should have the benefit of this information. It is hardly worth while to say that one negative sputum examination in the presence of definite signs and symptoms does not exclude the disease; even in far advanced cases, where the diagnosis is beyond question, the sputum may be repeatedly negative. Of a hundred and seventy-two cases now in the Sanatorium, fifty-five per cent of these show the presence of tubercle bacilli in the sputum. This, of course, includes minimal, moderately advanced, and far advanced cases. In every instance where the sputum was positive, we were able to find other signs and symptoms that were quite sufficient to justify the diagnosis. A further observation has been made; the patient, who after the treatment has been well established, continues to dispense the bacilli in the sputum, usually has an extension of the disease and a bad prognosis.

By further observation it will be noted that the presence of a slight afternoon rise in the temperature, cough, general malaise, loss of weight, and anorexia strongly suggest pulmonary disease; but pleurisy with effusion, hemorrhage, rales heard after cough in an apex, are sufficient to establish a definite diagnosis; in fact any one of the latter may be sufficient. Furthermore, when tubercle bacilli appear in the sputum or hemorrhage has taken place, it means that the disease has advanced to the point of producing a parenchymatous lesion and requires not only a longer period of treatment, but the patient has less chance for complete recovery. A point that needs further emphasis is the correlation of the X-ray with the clinical data. No chest examination is complete without stereoscopic films, and what internist has not seen cases from whose history and physical examination nothing could be definitely found, only to be swept off his feet by a startling report from the roentgenologist of the presence of early tuberculosis? The X-ray, of course, has its limitations and must be studied and compared with signs and symptoms in an harmonious manner and along educational lines if grave mistakes are to be avoided. "Fanciful" and "visionary" interpretations must be avoided. If early lesions are to be diagnosed and errors in X-ray work minimized it is quite essential that the operator have some knowledge of the pathology and immuniology of tuberculosis as well as the histological anatomy of the lungs. We do not expect the X-ray to tell us whether the lesion is active or inactive, whether the patient is going to get well, or how long treatment will be required, but to assist with the diagnosis only.

The prognosis of the disease will naturally depend upon several things, the most important of which are early diagnosis and treatment. Our experience has been that the smallest amount of involvement in the chest should have from six to twelve months of absolute rest and relaxation. By this is meant that the patient should be put to bed in a quiet place in the open air away from all business cares and responsibilities and be made to feel that his first duty to himself and his people is to get well. It goes without saying that this can be best carried out in a sanatorium. Even after this period, for two or three years, and in most cases the rest of their lives, they must take every precaution, or there is great danger of relapse. It must be remembered that tuberculosis is usually a chronic disease which is characterized by alternating periods of quiescence and exacerbations, and one is not often as well as his or her feelings would indicate. It takes time to accomplish results and certain sacrifices must be made. The disease is not going to change to suit the habits of the patient, but the patient must regulate his or her life to that of the disease if he or she expects to prosper and win over its deceit.

About seventy-five per cent of the minimal cases will get good results if the proper treatment is given, and by careful living, periodical examinations, and advice, be able to return to work with little danger of recurrence of the trouble. With the far advanced cases there can usually be no hope for a complete restoration to normal functions and the patient must be contented with a partial repair and be spared the usual exertions of trying to make a living for himself.

The following case histories will illustrate the marked tendency to a relapse if proper precautions are not taken and the orders of the physician carried out.

Case 1.—Woman, age 21 years, occupation, pupil nurse, in January, 1923, was admitted to a sanatorium in Asheville with pleurisy with effusion and a small amount of exudation in left apex. After remaining there for eight months she was discharged as "apparently arrested" with no physical signs, or X-ray findings, and permitted to enter a training school

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for nurses. At the time of her admission to the training school, October, 1923, she was apparently in excellent physical condition. No symptoms of tuberculosis were present, she was up to her normal weight and feeling well. On physical examination there was evidence of a thickened pleura at the left base and a small amount of fibrosis in the apex of the left lung. The interpretation of the stereoscopic X-ray plates taken at this time was as follows: Right lung: Negative except for slight thickening and small amount of beading along the course of the ascending trunks. Left lung: Above the third rib, anteriorly, the trunks are heavy and extend to the periphery, and well-defined, minute, calcified areas are studded along their course. The costo-phrenic angle is partially obliterated and some clouding is noted in the extreme base which is thought to be due to a thickened pleura. Before discharge from the sanatorium in Asheville, this patient was given definite instructions on how to live. She was told that she must live a systematic, routine life, avoiding all unnecessary physical exertions, such as, dancing, swimming, and hiking and that she must rest regularly and eat a liberal amount of good, wholesome food. When she took up her duties as pupil nurse these points were further emphasized to her. For the first three or four months she obeyed these suggestions and during that time gained twenty pounds in weight, but the prosperity was too much for her. Soon she became careless and would eat only the things that her finicky appetite called for, would not rest when off duty, began to dance and swim. At present there is a definite parenchymatous involvement of the left upper lobe and medium moist rales can be heard after cough to the third rib in front and to the fifth dorsal vertebra behind. She has been taken off duty and put to bed.

Case 2.—Woman, aged 27, occupation, graduate nurse. As a child and during the period of adolescence she was undernourished, had a poor appetite, and would eat only the things she liked best. In 1915, at the age of eighteen, she was diagnosed as having incipient tuberculosis. She spent six months in a sanatorium and was discharged as greatly improved. She returned home and continued the treatment there according to instructions for three years before taking up nursing. In October, 1923, while nursing, she had an attack of pleurisy. For two or three years previous to this she had discontinued her rest periods, attended many dances, was up late at night, took much strenuous exercise, and ate very little nourishing food. She would often go all day without eating more than one meal, and even then "mincing" over her food, discarding the things that she did not like. Soon after the attack of pleurisy, she reported for physical examination and X-ray. No moisture could be found on examination, but a small amount of exudation was present in the right apex. She was advised to stop work and take treatment, but was feeling better at this time and decided to return to work. In April, 1924, she returned for another examination and X-ray and at this time she had definite rales, heard after cough, in the right apex, and a more pronounced lesion on the X-ray plates. At this time she was admitted to the sanatorium and put to bed. After three months of complete rest in bed, it was found that the lesion had continued to spread and was beginning to break down and cavitate. The lung was then collapsed by artificial pneumothorax, (plates made showed collapsed lung). Sufficient time has not elapsed to say what results will be accomplished by this procedure.

Case 3.—Male, aged 28. In November, 1923, had pleurisy with effusion in the left side (previous to this was perfectly well except for a run-down condition). At this time 3,500 c.c. of straw-colored fluid was aspirated. Microscopic and guinea pig inoculation negative for tuberculosis. For six months following the pleurisy the patient spent the greater part of his time in bed, and during this period gained about twenty pounds in weight. After returning to work, he worked only in the morning and devoted the remainder of the day to rest and relaxation. After keeping up this schedule for a time, he did not feel as well as he desired, so in May, 1924 I saw him for the first time. On physical examination there was evidence of a small amount of fibrosis in both apices with a thickened pleura at the base. The X-ray, however, in addition to these, showed some involvement in the left apex which strongly suggested activity. He was told that this involvement was tuberculous in nature and was advised to give up his work for an indefinite period and go to a sanatorium and take treatment. This he refused to do and continued to work half-day and take the treatment the remainder of the time at home. In September he came for another examination, and, with the stethoscope, no extension of the

trouble could be made out, but a rather pronounced exudation in both apices was seen on the X-ray plates. In spite of this extension of the trouble he was not running any symptoms and stated that he was feeling well. Beyond a doubt his involvement is spreading and unless he agrees to give up and take the treatment as he should, he may soon be in a hopelessly advanced condition.

Discussion of Cases

These three cases are reported because they illustrate fully the points I wish to bring out in this paper. First, the diagnosis of early tuberculosis is by no means always an easy task. Many cases come up for consideration that require not only skill, but time if errors are to be avoided. Two of these cases you will note had as their onset pleurisy with effusion and practically no other indications of disease for several months. None of them had any expectoration, and a sputum examination could not be made. It is seen that the X-ray revealed definite trouble in each case when it could not be found on physical examination and even before sufficient symptoms had developed for the patients to feel ill. A study of the stereoscopic plates demonstrated the necessity of serial pictures for comparison and study.

All of these cases disobeyed medical advice and were not willing to take treatment until there was definite physical impairment. They indulged in pleasures, which called for fatigue and undue physical exertion, and in this way undermined and lowered their resistance and made a relapse more likely. The necessity for proper food and nourishment is appreciated not only to prevent a return of the disease, but its development as well. Many poorly developed and undernourished children are targets for the disease and will surely develop it unless proper steps are taken to correct it. Mothers must be taught how to feed their children and emphasis given to rest periods, then their bodies will be stronger and more disease-resisting.

Proceedings of Societies

The Virginia State Board of Medical Examiners,

At its examinations held in Richmond, in December, granted certificates to practice medicine in Virginia to twenty-four doctors. There were no failures except with those taking the partial examinations. Those obtaining certificates are:

Dr. Anthony D. Amerise, Pardee, Va., Jefferson Medical College, 1922.

Dr. E. Osmund Barr, Charlottesville, Va., University of Virginia, 1924.

Dr. Numa D. Bitting, Durham, N. C., Jefferson Medical College, 1907.

Dr. Wilbur M. Bowman, Petersburg, Va., University of Virginia, 1924.

Dr. W. Preston Burton, Covel, W. Va., Jefferson Medical College, 1923.

Dr. Leroy A. Calkins, Charlottesville, Va., University of Minnesota, 1919.

Dr. Harry G. Camper, Welch, W. Va., Baltimore Medical College, 1912.

Dr. Samuel Conway Crow, Wayne Co., Mich., Michigan Medical School, 1898.

Dr. Lewis T. Cosby, Jr., Abingdon, Va., Medical College of Virginia, 1901.

Dr. Clara K. Dickinson, Marion, Va., Woman's Medical College of Pennsylvania, 1923.

Dr. Zenobia G. Gilpin, Richmond, Va., Howard University, 1923.

Dr. Charles O. Harris, Washington, D. C., Howard University, 1913.

Dr. Vincent Hermandez, Yorktown, Va., University of Georgetown, 1918.

Dr. Alfred B. Hodges, Portsmouth, Va., College of Physicians and Surgeons, Columbia University, 1919.

Dr. Ulysses L. Houston, Washington, D. C., Bennett Medical College, 1912.

Dr. Thaddeus E. Jones, Portsmouth, Va., University of Pennsylvania, 1924.

Dr. William Lueders, Jr., Harrisonburg, Va., University of Maryland, 1920.

Dr. Emanuel Newman, Richmond, Va., Rush Medical College, 1922.

Dr. J. R. Parker, Clinton, N. C., University of Maryland, 1898.

Dr. William A. Porter, Norfolk, Va., McGill University, 1921.

Dr. Walter G. H. Pott, Norfolk, Va., University of Virginia, 1917.

Dr. Ernest F. Slater, Portsmouth, Va., University Medical College, Kansas City, Mo., 1899.

Dr. Nelson W. Sisson, Orange, N. J., University of Virginia, 1924.

Dr. Benjamin D. Turnman,* Richmond, Va., American School of Osteopathy, 1916.

*Dr. Turman, osteopath, was previously licensed to practice in the State, but allowed to take the examination to qualify for surgery.

The Russell County Medical Society,

At a meeting held on January 7, elected Dr. E. P. Whited, Honaker, president for the ensuing year, and Dr. C. B. Greear, also of Honaker, secretary-treasurer. The attendance was good and interesting and highly instructive case reports were given by Dr. Daniel Trigg, of Lebanon, and Dr. S. C. Couch, of Cleveland. These cases were discussed at length and those present stated that they had derived much benefit from the meeting.

Doctors attending the meeting reported a number of cases of "flu" in their practice, but without many complications, to this time. Dr. Kemp Gilmer, of Lebanon, reported some typhoid fever in his practice, complicated with hemorrhages.

It is conceded that no county should be without a highly organized medical society, not only for the benefit to the physician but also for the interests of the respective communities. The county medical society is the next best work to that of taking post-graduate study and every physician should be a member of his local medical society, or he is missing an opportunity he can ill afford.

C. B. Greear, *Sec'y.*

The Lynchburg and Campbell County Medical Society

Held its meeting for the election of officers for 1925 at the Piedmont Club, Lynchburg, December 8th. Dr. Hunter B. Spencer was elected president, Dr. W. S. Ferguson vice-president, and Dr. F. Musgrave Howell secretary-treasurer.

The first monthly meeting of the new year was held on January 5th, at which time Dr. Dean B. Cole, of Richmond, read an interesting paper on "The Determination of Activities in Tuberculosis." The meeting was well attended.

The Dinwiddie County Medical Society,

At its meeting in December, elected the following officers for the ensuing year: Dr. D. C. Mayes, Church Road, president; Dr. George W. Fultz, Butterworth, vice-president; and Dr. William C. Powell, Petersburg, (re-elected) secretary-treasurer. Drs. W. I. Prichard and A. B. Sloan were elected members of the Society.

Special Meeting of Norfolk County Medical Society.

Among the customs of the Norfolk County Medical Society is that whenever a fifth Monday occurs in a month, the program for that evening is directly under control of the president. It so happened that on the 29th of December the Society was temporarily without a home, as its furnishings were in process of removal from the old to the new hall, so the president, Dr. R. L. Payne, secured the use for that evening of a commodious hall in the Parish House of Christ Church and, in conjunction with the Women's Auxiliary of the Society, entertained the members of both organizations to a social evening, a large part of the program being in the form of moving pictures, partly of a professional nature and partly showing the haunts and habits of many of the wild animals indigenous to our country. These were greatly enjoyed by all present, as were the refreshments which followed. The example set by Dr. Payne may well be emulated on some future occasions.

The Truth About Medicine

In addition to the articles enumerated in our letter of November 29th, the following have been accepted:

Abbott Laboratories:
- **Tablets Benzyl Fumarate—Abbott, 5 grains.**

Gilliland Laboratories:
- **Diphtheria Toxin-Antitoxin Mixture 0.1 L+**

Hynson, Westcott and Dunning
- **Sealed Tubes Mercurochrome—220 Soluble 0.5 Gm.**

Lederle Antitoxin Laboratories:
- **Intracutaneous Tuberculin for the Mantoux Test.**

Lehn and Fink:
- **Corpus Luteum—L. and F. Desiccated**
  - **Capsules Corpus Luteum—L. and F. Desiccated, 2 grains.**
  - **Capsules Corpus Luteum—L. and F. Desiccated, 5 grains.**
  - **Tablets Corpus Luteum—L. and F. Desiccated, 2 grains.**
  - **Tablets Corpus Luteum—L. and F. Desiccated, 5 grains.**
- **Ovarian Residue—L. and F. Desiccated**
  - **Capsules Ovarian Residue—L. and F. Desiccated, 5 grains.**
  - **Tablets Ovarian Residue—L. and F. Desiccated, 2 grains.**
  - **Tablets Ovarian Residue—L. and F. Desiccated, 5 grains.**
- **Ovarian Substance—L. and F. Desiccated**
  - **Capsules Ovarian Substance—L. and F. Desiccated, 2 grains.**
  - **Capsules Ovarian Substance—L. and F. Desiccated, 5 grains.**
  - **Tablets Ovarian Substance—L. and F. Desiccated, 2 grains.**
  - **Tablets Ovarian Substance—L. and F. Desiccated, 5 grains.**

Mallinckrodt Chemical Works:
- **Mallinckrodt Tetrabromphenolphthalein Sodium Salt**
- **Mallinckrodt Tetrabromphenolphthalein Sodium Salt, 5 Gm. Ampules.**

H. K. Mulford Co.:
Neorobin
Vacuum Sealed Tubes Neorobin, 1 grain
Vacuum Sealed Tubes Neorobin, 5 grains.
New York Quinine and Chemical Works:
Euquinine—N. Y. Q.
E. R. Squibb and Sons.
Bacillus Bulgaricus—Squibb.
Nonproprietary article:
Tetrabromphenolphthalein Sodium.

NEW AND NONOFFICIAL REMEDIES.

Iletin (Insulin—Lilly) U-80.—Five c.c. ampules containing 80 units of iletin (insulin—Lilly) (New and Nonofficial Remedies, 1924, p. 152) in each c.c. Eli Lilly and Co., Indianapolis.

Ampules Adrenalin Chloride Solution Rx 1, 1:1000, 1 c.c.—A solution of adrenalin chloride (New and Nonofficial Remedies, 1924, p. 117), one part in physiological solution of sodium chloride, 10,000 parts without preservative. Parke, Davis and Co., Detroit.

Ampules Adrenalin Chloride Solution Rx, 1:2,600, 1 c.c.—A solution of adrenalin chloride (New and Nonofficial Remedies, 1924, p. 117), one part in physiological solution of sodium chloride, 2,600 parts, without preservative. Parke, Davis and Co., Detroit.

Ampules Adrenalin Chloride Solution 1:1,000, 1 c.c.—A solution of adrenalin chloride (New and Nonofficial Remedies, 1924, p. 117), one part in physiological solution of sodium chloride 1,000 parts, without preservative. Parke, Davis and Co., Detroit.

Benzyl Succinate—Merck.—A brand of benzyl succinate—N. N. R. For a discussion of the actions and uses of benzyl compounds, see Journal A. M. A., Dec. 6, 1924, p. 1864. Merck and Co., New York.

Thigenol.—Solution Sodium Sulpho-Oleate-Roche.—A solution of the sodium salts of synthetic sulphooleic acid containing 2.85 per cent. of sulphur. Thigenol has the actions and uses of sulphoichthyolate preparations (New and Nonofficial Remedies, 1924, p. 350). The Hoffman-LaRoche Chemical Works, New York.

Sterile Ampules Mercuric Potassium Iodide, 0.017 Gm. (¼ grain).—A solution of potassium mercuric iodide obtained by dissolving red mercuric iodide 0.01 Gm., and potassium iodide, 0.01 Gm. in water, 1 c.c. Swan-Myers Co., Indianapolis (Journal A. M. A., Dec. 6, 1924, p. 1847).

Ergotole.—Extractum Ergotae Liquidum.—A liquid extract of ergot containing 19 per cent. of alcohol. It is standardized on the uterus of the virgin guinea pig so that a 1:2,500 dilution of ergotole has the same activity as a 1:20,000,000 solution of beta-iminazolyl-ethylamine hydrochloride. The actions and uses of ergotole are the same as those of ergot. Ergotole is also marketed in ampules containing 1 c.c. Sharp and Dohme, Baltimore.

Hypodermic Tablets Strophanthin 1/100 grain.—Lilly.—Each tablet contains strophanthin U. S. P., 1/100 grain. Eli Lilly and Co., Indianapolis.

Hypodermic Tablets Strophanthin 1/120 grain. Lilly.—Each tablet contains strophanthin U. S. P. 1/120 grain. Eli Lilly and Co., Indianapolis.

Hypodermic Tablets Strophanthin 1/200 grain. S. and D.—Each tablet contains strophanthin U. S. P. 1/200 grain. (0.325). Sharp and Dohme, Baltimore.

Ampules Ouabain 0.0003 Gm. (1/128 grain)—Lilly.—Each ampule contains ouabain crystallized—N. N. R., 0.0005 Gm. in 2 c.c. of a buffered, sterile normal salt solution. Eli Lilly and Co., Indianapolis.

Compressible Capsules Mercury Salicylate "Synthetic," 1 grain for Intramuscular Injection.—Mercuric salicylate 0.065 Gm. (1 grain) suspended in 1 c.c. of a mixture of benzoinated lard, 67 per cent.; peach kernel oil, 31 per cent.; camphor, 1 per cent.; phenol, 1 per cent. Synthetic Drug Co., Toronto, Canada.

Compressible Capsules Mercury Salicylate "Synthetic," 1½ grain for Intramuscular Injection.—Mercuric salicylate 0.1 Gm. (1½ grain) suspended in 1 c.c. of a mixture of benzoinated lard, 67 per cent.; peach kernel oil, 31 per cent.; camphor, 1 per cent.; phenol, 1 per cent. Synthetic Drug Co., Toronto, Canada.

Compressible Capsules Mercury Salicylate "Synthetic," 2 grains for Intramuscular Injection.—Mercuric salicylate 0.13 Gm. (2 grains) suspended in a mixture composed of benzoinated lard, 67 per cent.; peach kernel oil, 31 per cent.; camphor, 1 per cent.; phenol, 1 per cent. Synthetic Drug Co., Toronto, Canada. (Journal A. M. A., Dec. 13, 1924, p. 1923).

Novasurol.—The double salt of sodium mercurichlor phenyloxyacetate with barbital. Novasurol contains 33.9 per cent. of mercury. Novasurol is used chiefly as a diuretic. It has the advantage over mild mercurous chloride and other insoluble mercury compounds in that it is soluble and may be administered by intramuscular and intravenous injection. The best results have been obtained in dropsies due to cardiac disease. Some authors hold that soluble mercury compounds should be used for their diuretic action, only as a last resort when other drugs have failed. As an antisyphilitic, novasurol has generally been injected intravenously mixed with one of the arsphenamines. Novasurol is supplied in ampules containing 1.2 c.c. of a 10 per cent. solution. Winthrop Chemical Co., New York.

Euquinine—N. Y. Q.—A brand of quinine ethylcarbonate—N. N. R.—For a discussion of the actions, uses and dosage of quinine ethyl carbonate—N. N. R.—(New and Nonofficial Remedies, 1924, p. 267). New York Quinine and Chemical Works, New York. (Journal A. M. A., Dec. 20, 1924, p. 2019).

Tetrabromphenolphthalein Sodium.—The sodium salt of a dibasic dye, tetrabromphenolphthalein. Tetrabromphenolphthalein sodium is used for the roentgenologic examination of the gall-bladder. Following intravenous injection the substance appears in the gall bladder in sufficient concentration to cast a shadow to the roentgen ray. After injection, some of the patients may have unpleasant symptoms such as dizziness, nausea, various body pains, and fall in blood pressure. The use of tetrabromphenolphthalein sodium is still in the experimental stage and workers are cautioned as to the selection of types of cases in which it is indicated and its possible toxicity in large doses. To visualize the gall bladder, 4.5 to 5 Gm. is sufficient for a patient weighing 125 pounds or more, and should be reduced for patients weighing less. (Journal A. M. A., Dec. 27, 1924, p. 2095).

PROPAGANDA FOR REFORM.

Goiter Prevention.—Persons affected with thyroid disturbances have been aroused to the possibilities of relief that modern medicine offers, the public has been awakened to the problems that confront many of our communities, and the medical profession has been stirred to a realization of its duties to the public in demanding the institution of safe relief measures. The enthusiasm for relief measures must not be allowed to initiate the public into unwise or unwarranted practices. The fundamental concern of the health official is the prevention of endemic thyroid enlargement. In line with this the Cincinnati Board of Health Proposes to confine its work to prevention and will refer children known to have thyroid enlargement to their family physician. Iodized

table salt should not be regarded as a "cure all." It will probably not cure a simple goiter, and the primary purpose of the preparation is to aid in providing the iodin that is essential to the proper functioning of the thyroid gland in normal persons who compose the majority of the population. The exceedingly small quantity of iodin made available in this way must be skilfully supplemented by physicians when definite thyroid enlargement exists. (Journal A. M. A., Dec. 6, 1924, p. 1849.)

Chlorin in Respiratory Diseases.—In New York two clinics were established by the Health Commissioner to determine the efficiency of chlorin inhalations in the treatment of respiratory diseases. These clinics began active work June 1. They continued in operation until August 1, when they were closed because the results were considered unsatisfactory. It is reported that only 6.5 per cent. of 506 persons with various respiratory diseases reported themselves as cured. Fifty-three per cent. of the patients reported improvement, but the physicians in charge do not attach much importance to such reports since it is well known that patients with minor respiratory infections tend to improve by the very nature of their disease. It is evident that the physician who uses the chlorin treatment in his practice, must do so with the distinct understanding that he is using an unestablished method. (Journal A. M. A., Dec. 6, 1924, p. 1851.)

Benzyl Compounds.—The Council on Pharmacy and Chemistry reports on the therapeutic status of benzyl compounds. It was shown a few years ago that the papaverin group of opium akaloids caused relaxation and inhibition of smooth muscle fibre and it was suggested that this action was dependent on the benzyl grouping in the papaverine molecule. This suggested that possibly the same action might be secured from simpler benzyl compounds, and a number of benzyl esters were investigated. Soon the use of benzyl esters in medicine gained considerable vogue. They have been recommended in hypertension, asthma, angina, dysmenorrhea, biliary and renal colic and similar disorders. The council finds that extensive clinical use does not confirm the enthusiastic estimate of the early advocates. An inquiry addressed to a number of clinicians disclosed an almost unanimous opinion against the value of these preparations so far as most of the recommended uses are concerned. None had seen any action whatsoever in hypertension, nor had the blood pressure been lowered. None of the consultants had seen any effects from the use of benzyl esters in asthma, or in renal or biliary colic. Benzyl esters had apparently given relief in a certain number of cases of dysmenorrhea. A small percentage of patients with angina pectoris appeared to have been benefited by their use; also a few cases of intestinal colic, which might be explained by a carminative action. (Journal A. M. A., Dec. 6, 1924, p. 1864.)

"Prince Hough" Declared a Fraud.—For some time a seventy-year-old colored man has been swindling people through the mails from De Soto, Mississippi. He has gone under the name "Prince Hough" and "Dr. P. F. Hough." He represented that he could diagnose any disease by having his patient "spit on a piece of white cloth" and send it to him. He claimed that he would furnish medicine that would cure syphilis, tuberculosis and other conditions equally serious diagnosed by him by the white cloth method. The post office authorities investigated the fraud and debarred "Prince Hough" from the use of the mails. (Journal A. M. A., Dec. 6, 1924, p. 1864.)

The Danish Gold Treatment of Tuberculosis.—Hardly a year passes but that the announcement is made of some new method of treating tuberculosis. The most recent method to receive sensational publicity duly accorded any venture in the treatment of tuberculosis, is a preparation of gold advanced in Denmark under the name "Sanocrysin." At a meeting of physicians in Denmark, Professor Moellgaard, the originator of the remedy, described its production and its effects. Other physicians gave an account of their results with the treatment. Several deaths from the remedy were reported. It is stated that Professor Moellgaard was the most cautious of all who spoke. (Journal A. M. A., Dec. 13, 1924, p. 1928.)

Black Hair Dye.—No black hair dye can be considered safe and not injurious. Every chemical used for dying the hair black is a potential trouble maker. Some individuals who are not sensitized, may even use paraphenylendiamin for long periods without causing any disturbance, whereas others cannot use silver nitrate or pyrogallic acid. These facts should be given to the public and the user should assume the responsibility for the dermatitis which may follow. A person's sensitiveness to a given dye may be determined by its application to a covered portion of the body. (Journal A. M. A., Dec. 13, 1924, p. 1943.)

Valamin Not Accepted for N. N. R.—The Council on Pharmacy and Chemistry reports that Valamin is stated to be "Amylene Hydrate Iso Valerianate" and that it is a German product marketed in the United States by the American Kreuger and Toll Corporation, New York. Valamin is claimed to be a dependable sedative and analeptic. It is claimed that Valamin is a recent discovery which will restore valerian to favor with the medical profession. Valamin is not a recent discovery and the reports of its use do not indicate that it has any special value. The Council declared Valamin inadmissible to New and Nonofficial Remedies, because (1) the therapeutic claims are unwarranted and (2) because more than ten years of trial has failed to produce evidence that it is a useful addition to our materia medica. (Journal A. M. A., Dec. 13, 1924, p. 1941.)

Valerian Omitted From Useful Drugs and Amyl Valerate Omitted from N. N. R.—The Council on Pharmacy and Chemistry reports that for some years it has been viewing the claims for the therapeutic value of valerian and valerian preparations and substitutes with increasing skepticism. During the period 1915 to 1921, the Council questioned the claims made for a number of proprietary valerian preparations then in New and Nonofficial Remedies. In the end these products were omitted because they were off the market. Valerian has been retained in Useful Drugs because it is used to a considerable extent. This use, however, appears to be based on tradition. The Council reached the conclusion that there is no acceptable evidence for the therapeutic usefulness of valerian or the valerian substitutes now on the market. It, therefore, decided (1) to omit valerian from Useful Drugs; (2) to omit the general article "Valeric Esters" along with amyl valerate (the only preparation now in the book) from New and Non-official Remedies, and (3) to admit to New and Nonofficial Remedies no preparation which depends on valerian or its constituents unless satisfactory new evidence for its therapeutic value is submitted. (Journal A. M. A., Dec. 13, 1924, p. 1941.)

Hexylresorcinol ("Caprokol").—The Council on Pharmacy and Chemistry publishes a report on the experimental status of hexylresorcinol, a new urinary antiseptic discovered by Dr. Veader Leonard. Dr. Leonard has studied the effect of the oral ad-

ministration of a series of resorcinol derivatives on the action of urine towards bacteria. He found the normal hexyl derivative of resorcinol the most effective and reports animal and clinical trials with the drug. Hexylresorcinol was found to be practically without toxic action and when administered in adequate doses, found to render urine distinctly bactericidal, even when it is alkaline in reaction. Because of the strong bactericidal action of hexylresorcinol in either acid or alkaline urine, the rapid and continuous excretion over a considerable period of time following oral administration, and its low toxicity, it gives promise of proving a useful disinfectant of the urinary tract. However, the work of Dr. Leonard must be confirmed by other investigators before it can be accepted. A preparation of hexylresorcinol is to be marketed by Sharp and Dohme as "Hexyl-Resorcinol—S. and D.", or "Caprokol" in the form of pills. The drug as employed by Dr. Leonard, however, differs from the commercial product in that it is marketed in pill form, and it remains to be determined that these pills will produce the effects reported by Dr. Leonard. The Council reports that hexylresorcinol will be eligible for New and Nonofficial Remedies if its therapeutic usefulness is established by confirmatory clinical trials; in that case Hexyl-Resorcinol—S. and D. (Caprokol) will be accepted if the form in which it is marketed is found satisfactory and the advertising claims acceptable. (Journal A. M. A., Dec. 20, 1924, p. 2018.)

Succus Cineraria Maritima and Phytoline.—These are marketed by the Walker Pharmacal Co., which, like the Manola Chemical Co., appears to have been practically a subsidiary of the Luyties Homeopathic Pharmacy Co. In 1911 the Council on Pharmacy and Chemistry reported that the juice of a plant referred to as cineraria maritima was at one time supposed to be of value in the treatment of cataract and certain other affections of the eye, but that there was no evidence that the drug had any value. Cineraria maritima would long since have been relegated to the limbo of discarded and discredited drugs had it not been for the exploitation of succus cineraria maritima (Walker) by the Walker Pharmacal Co. The claims of the Walker Pharmacal Co. in regard to phytoline, divested of their mystery and improbability, suggest that this is a tincture of poke-berries. While Phytoline is advertised as a "Powerful Antifat," a hunter has reported the killing of fat pigeons whose gullets were filled with poke-berries. (Journal A. M. A., Dec. 20, 1924, p. 2041.)

Book Announcements

Operative Surgery. Covering the Operative Technic Involved in the Operations of General and Special Surgery. By WARREN STONE BICKHAM, M. D., F. A. C. S., Former Surgeon in Charge of General Surgery, Manhattan State Hospital, New York; Former Visiting Surgeon to Charity and Touro Hospitals, New Orleans. In six octavo volumes totaling approximately 5,400 pages with 6,378 illustrations, mostly original, and separate Desk Index Volume. Volume VI. completing the set, contains 989 pages, with 1,224 illustrations. Philadelphia and London. W. B. Saunders Company. 1924. Cloth, $10.00 per volume. Sold by subscription only. Index Volume free.

Successful surgery depends on surgical judgment plus exact technic. The latter may be acquired from books, and surely there has never been produced so great a work as Bickham's—the fifth and sixth volumns of which are now on our table. Individual authorship with a complete system of cross references has done away with the numerous over-lappings and omissions so characteristic of systems.

This master surgeon and scholar has evidently spent years in accumulating the material for this work. The 6,400 illustrations are the product of forty-six artists, working 27,780 hours—the equivalent of about twenty years for one person. With consummate fiedlity to detail the author has endeavored to embrace everything worth while pertaining to Operative Surgery.

But above all he has ever kept in mind the most important issue in every surgical operation—the interest of the patient. Bickham says it is greatly more to the surgeon's credit to avoid than to perform an operation—to arrest, or correct the lesion without, rather than through, operation. If these ideals could become more nearly universal, if surgeons were always more interested in the welfare of their patients than in doing spectacular operations, then indeed would surgery become what it should be—the most beneficent expression of human handicraft. H.

Essentials of Prescription Writing. By CARY EGGLESTON, M. D., Assistant Professor of Pharmacology, Cornell University Medical College, New York City. Third Edition, Revised. Philadelphia and London. W. B. Saunders Company. 1924. 32mo. 146 pages. Cloth. Price, $1.50 net.

The Practice of Pediatrics. By CHARLES GILMORE KERLEY, M. D., formerly Professor of Diseases of Children, New York Polyclinic Medical School and Hospital, and GAYLORD WILLIS GRAVES, M. D., Associate in Diseases of Children in the College of Physicians and Surgeons, New York City. Third Edition, Revised and Reset. Philadelphia and London. W. B. Saunders Company. 1924. Octavo of 922 pages, with 150 illustrations. Cloth. Price, $9.00 net.

Diseases of the Heart. By DR. HENRI VAQUEZ, Professor of the Faculty of Medicine of Paris. Translated and Edited by GEORGE F. LAIDLAW, M. D., Associate Physician to the Fifth Avenue Hospital, New York City. Introduction by WILLIAM S. THAYER, M. D., Johns Hopkins Hospital, Baltimore, Md. Philadelphia and London. W. B. Saunders Company. 1924. Octavo of 743 pages, illustrated. Cloth. Price, $8.50 net.

Manual of Psychiatry. For the Medical Student and General Practitioner. By PAUL E. BOWERS, M. S., M. D., Examiner in Lunacy, State of California; Lecturer in Neuropsychiatry, Post-Graduate Medical School of the University of California, Los Angeles. Philadelphia and London. W. B. Saund-

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ers Company, 1924. Octavo of 365 pages. Cloth. Price, $3.50 net.

Pediatrics. By Various Authors. Edited by ISAAC A. ABT, M. D., Professor of Disease of Children, Northwestern University Medical School, Chicago, etc. Set complete in eight octavo volumes, totalling 8,000 pages with 1,500 illustrations, and separate Index Volume free. **Now Ready, Volume V.,** containing 865 pages with 373 illustrations. Philadelphia and London. W. B. Saunders Company. 1924. Cloth. Price, $10.00 per volume. Sold by subscription.

Child Health Library. By a GROUP OF PROMINENT SPECIALISTS AND SOCIAL WORKERS in New York City. Introduction by DR. HAVEN EMERSON. Robert K. Haas, Inc., Publishers. (Formerly, Little Leather Library Corporation), 218 West 40th Street, New York, N. Y. A series of ten books, vest pocket size, averaging about 100 pages each. Fabrikoid binding. Small book ends furnished with series.

The purpose of this series is to teach parents how to co-operate with the physician in promoting and preserving the health of the child. The series includes the following volumes:

I. Pre-Natal Care and the Baby's Birth.

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IV. Dangers of the School Age.

V. Communicable Diseases of Childhood.

VI. Hygiene of the Mouth and Teeth.

VII. What Children of Various Ages Should Eat.

VIII. How Children Ought to Grow.

IX. Psychology of the Child.

X. Educational Problems.

A Textbook of Materia Medica for Nurses. By A. L. MUIRHEAD, M. D., Late Professor Pharmacology, Creighton Medical College, Omaha, Nebraska, and EDITH P. BRODIE, A. B., R. N., Instructor in Materia Medica and Therapeutics, Washington University School of Nursing, St. Louis, Mo. Second Edition. St. Louis. C. V. Mosby Company. 1924. 12mo. 190 pages. Cloth. Price, $2.00.

Anesthesia for Nurses. By COLONEL WILLIAM WEBSTER, D. S. O., M. D., Professor of Anesthesiology, University of Manitobo Medical School; Chief Anesthetist, Winnipeg General Hospital. St. Louis. C. V. Mosby Company. 1924. 12mo. 153 pages. Illustrated. Cloth. Price, $2.00.

Safeguarding Children's Nerves. A Handbook of Mental Hygiene. By JAMES J. WALSH, M. D., Professor of Physiological Psychology, Cathedral College, New York, and JOHN A. FOOTE, M. D., Professor of Diseases of Children, Georgetown University Medical School, Washington, D. C., with a foreword by HONORABLE HERBERT HOOVER. Philadelphia and London. J. B. Lippincott Company. 1924. Small 8vo. 272 pages. Cloth. Price, $2.00.

Developmental Anatomy. A Text-Book and Laboratory Manual of Embryology. By LESLIE BRAINERD AREY, Professor of Anatomy at the Northwestern University Medical School, Chicago. Philadelphia and London. W. B. Saunders Company. 1924. Octavo volume of 433 pages, with 419 illustrations, many in color. Cloth, $5.50 net.

Human Constitution. A Consideration of Its Relationship to Disease. By GEORGE DRAPER, M. D., Associate in Medicine at Columbia University, New York. Philadelphia and London. W. B. Saunders Company. 1914. 8vo. 345 pages, with 208 illustrations and 105 tables. Cloth. Price, $7.50 net.

Studies on the Morphology and Morphogenesis of Human Thoracopagic Monsters, with Special Reference to the Malformation of the Heart. Inaugural Dissertation, by FREDRIK YSANDER. Uppsala, 1924. Almqvist & Wiksells Boktryckeri. A.-B. Paper. 236 pages with plates.

Physical Diagnosis. By W. D. ROSE, M. D., Lecturer on Physical Diagnosis and Associate Professor of Medicine in the University of Arkansas. Fourth Edition. St. Louis. The C. V. Mosby Company. 1924. 755 pages, with 319 illustrations, 8vo. Cloth. Price, $8.50.

A Text-Book of Pathology. By WILLIAM G. MacCALLUM, M. D., Professor of Pathology and Bacteriology, Johns Hopkins University, Baltimore. Third Edition, thoroughly revised. Philadelphia and London. W. B. Saunders Company. 1924. 8vo of 1,162 pages, with 575 original illustrations. Cloth, $10.00 net.

A Manual of Obstetrics. By JOHN COOKE HIRST, M. D., F. A. C S., Associate in Gynecology and Obstetrics, Graduate School of Medicine, University of Pennsylvania; Associate in Obstetrics, School of Medicine, University of Pennsylvania. Second Edition, entirely reset. Philadelphia and London. W. B. Saunders Company. 1924. 12mo of 551 pages with 229 illustrations. Cloth, $4.50 net.

Concealed Tuberculosis or "The Tired Sickness." A Clinical Study Upon the Exhaustion Type of Hidden Tuberculous Infections. By GEORGE DOUGLAS HEAD, M. D. Philadelphia. P. Blakiston's Son and Company. 1012 Walnut Street. 12mo of 137 pages. Cloth. Price, $2.00.

International Clinics. A Quarterly of Illustrated Clinical Lectures and Especially Prepared Original Articles on Treatment, Medicine, Surgery and the Various Specialties. By Leading Members of the Medical Profession Throughout the World. Edited by HENRY W. CATTELL, A. M., M. D., Philadelphia, and Collaborators. Volume IV. Thirty-fourth Series, 1924. Philadelphia and London. J. B. Lippincott Company. 1924. Octavo. Cloth. Illustrated. 308 pages.

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Editorial

The Cerebrospinal Fluid.

Examination of the cerebrospinal fluid has great diagnostic value. It tells much about the condition of the tissues of the brain and spinal cord in a very similar manner to that of the examination of the urine which reveals much of the condition of the tissues of the kidneys.

Many elaborate laboratory tests may be made on the cerebrospinal fluid but clinically the chief practical points to note are: 1. its pressure, 2. its color, 3. the number and character of cells per cubic centimeter, 4. its globulin content, 5. its sugar content, 6. its Wassermann reaction, 7, its colloidal gold curve, 8. a bacterial examination. Thus space restricting lesions, hemorrhage, acute infections and other conditions may be suspected.

Withdrawal of cerebrospinal fluid has definite therapeutic value under certain circumstances—pressure may be relieved in states of increased intracranial pressure such as acute hydrocephalus, encephalitis and meningitis or the fluid may be partially drained in some of the so-called metasyphilitic conditions, especially after the intravenous administration of salvarsan. Again, therapeutically, salvarsan, urotropin and other drugs and various sera and antitoxins may be injected intraspinously into the cerebrospinal fluid.

The cerebrospinal fluid flow from the puncture point may be increased by such voluntary effort as straining or coughing, or this increase may be blocked by tumor or obstructive lesion of the cord or by pressure on the carotids—Queckenstaedt sign. This fluid is secreted by the choroid plexus and absorbed by the cranial and spinal veins. General changes in the fluid pressure may be obtained by the administration of sodium chloride solution by mouth or in the veins to decrease, or pituitrin administered subcutaneously to cause an increase in the cerebrospinal fluid. Thyroid extract is thought to inhibit the amount of fluid to a certain extent, but this is questionable.

The contraindications to lumbar puncture are the presence, to any considerable degree, of choked disc, the presence of tumor of the cerebellum, pons or medulla, too sudden relief of pressure after brain or spinal cord hemorrhage and early stages of apparently localized meningitis where relief of pressure may spread the infection. One should be careful not to relieve too much fluid at one time, especially in cases of low pressure and the fluid should not be too completely drained.

Lumbar puncture headache is a complication in about one of thirty lumbar punctures. Its cause is much disputed. It is best treated by keeping the patient in bed, lowering the head, the administration of pituitrin and, if necessary, codeine. It is best prevented by putting the patient in a semi knee-chest position, with pillows under the abdomen for comfort, for an hour; elevation of the foot of the bed; prohibition of the use of pillows under the head for twenty-four hours; requiring the patient to stay strictly in bed for twenty-four hours.

Lumbar puncture is a safe procedure in careful hands, its performance is easily acquired by instruction and practice and it may be done on patients of any age, but it is not in general enough use and it is too frequently carelessly performed.

B. R. T.

Crime and Medicine.

That crime is frequently a symptom of a medical or surgical condition or disease is a very modern conclusion which is not widely accepted. Unless criminality hits home to the individual, the idea of crime being largely a medical problem is frowned down upon or entirely ruled out of court. But when criminality injects itself into a family it is remarkable how quickly they see the light.

Without going into the statistics, which are becoming available from various sources, let us state here that a large percentage of crimes as they are called, are committed by children mentally from five to ten years of age, but who have the statures and actual ages of adults.

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Many are criminals because they are insane and the jails and penitentiaries contain numbers of irresponsible cases of dementia praecox, paranoia and manic depressive psychosis, to say nothing of the paretics. Many are potentially or actually epileptic. Many are constitutionally psychopathic. Some have head injuries with definite pathology: a few have pituitary disturbance; thyroid upset; gonad dyscrasia; or tuberculosis rendering them susceptible to criminal impulses. The damage done the brain by bad or diseased heredity or by birth hemorrhage, forceps pressure, meningitis or encephalitis may account for both slight and gross conduct disorders. A nymphomaniac may have an adherent hood of the clitoris causing retention of the smegma and irritation, a male aggressor may have an inflamed verumontanum and a homosexual offender may have been born with or have acquired a reversal of many sex characteristics.

Every daily newspaper carries descriptions of crimes which, to the initiated, are as much symptoms of diseased condition as cough is of whooping cough. These irresponsible children and ill people form a considerable percentage of the population of every reform school, every jail, and every penitentiary. Staggering sums of money are spent yearly by the National and State governments in trying their cases and doling out "justice" to them. In truth, the method of handling the situation is reminiscent of the period of the inquisition, of the time of the dungeon and the mad house, of the days of the persecution of witch craft. It puts the emphasis of the middle ages on punishment. There is the suggestion of the hydrocephalic monster idol from whose emerald cyclopic eye some seem still to think they get gleams of justice—the eye for an eye, tooth for a tooth idea of justice!

Admitting, if you please, that something is wrong, when little children, brain injured and diseased people are treated by periods of penal servitude or capital punishment, what is to be done about it?

We should not approach the subject in a niggardly fashion, nor can it be solved by sporadic effort, no matter how well intentioned or enthusiastic. The first step should be to throw more light upon the general situation. This may be accomplished by individuals, newspapers, and periodicals informing the public of the vast amount of work that has been done and is being done in studying and classifying these unfortunates. When the public sees, then the politicians will begin to open their eyes. The next step would be to do away entirely with expert testimony employed by either the prosecution or defense in criminal cases, and have all cases adjudged by a non-partisan expert commission financed by the State or Federal government. The third step would be to have every arrested criminal physically and mentally examined by a competent and properly financed board who would report to the authorities the prisoner's condition and mental responsibility. A fourth step would be to have adequate especial conduct disorder institutes for the observation, care and treatment of these cases. And last, though probably it should be first, every school child should not only have its mental age taken and its tonsils and teeth looked after, but it should have a complete and intelligent physical and psychiatric examination combined with a social and medical follow-up system. These examinations should be universal, thorough, and, although we dislike the word, compulsory.

B. R. T.

News Notes

Place and Date for Annual Meeting of Medical Society of Virginia.

The Executive Council of the Medical Society of Virginia held a meeting on January 30, and decided to accept the invitation of the Richmond Academy of Medicine, to hold its next annual meeting in Richmond. Dates selected for this meeting are October 13, 14, 15 and 16, with headquarters at Jefferson Hotel. On account of housing accommodations, it was deemed inadvisable to meet during the State Fair week, but it was thought that many coming for the Fair would be able to stay over for this meeting.

Let's make this the biggest and best meeting in our history!

Harmonizing Workmen's Compensation Laws.

Workmen's compensation laws, even those of some adjoining states, differ either medically or legally in important details, says the National Industrial Conference Board, 247 Park Avenue, New York City, in presenting seventeen suggestions offered by its medical adviser, the Conference Board of Physicians in Industry, for harmonizing the medical differences

and thereby doing away with much confusion and many difficulties in the administration of the laws.

While there is a general similarity in all of the laws important differences are found in them which make for misunderstandings and discontent on the part of workmen having claims under them. This is particularly true in adjoining states, in one of which benefits for certain injuries may be much higher than for similar conditions in a neighboring commonwealth. The situation has been further complicated by decisions of industrial commissions and courts which often make opposite interpretations of identical phraseology in different laws.

The Board of Physicians suggests, in effect, that—

At least one member of each state compensation board should be a physician, who should also be the medical director of the board;

Each board should have a consulting staff of specialists to advise it on medical problems;

Examining physicians should be appointed by the state board on recommendation of the consulting staff on the basis of their professional qualifications;

Only licensed graduates of recognized medical schools should be permitted to treat compensation cases;

Medical fees should conform to the average charges for like work in the community;

"Medical treatment" should include all necessary medical, surgical and hospital care and attendance and also such supplies and appliances as may be necessary;

Examination of an injured worker should be made immediately following the injury and later examinations should be at the expense of the party requesting the same.

The choice of physician should be made by the employer or be made by the employee from a list of local physicians compiled by the employer;

Copies of the findings of examining physicians should be furnished to all interested parties, and reports and testimony of other physicians should not be allowed before the board till medical representatives of the other party have knowledge of the information to be given;

The refusal of medical treatment by the injured worker should release the employer from further responsibility in the matter;

Amputations should be made with regard to the function of the part remaining and not alone with regard to the amount of tissue removed, which latter proceeding might leave a tender appendage, useless for applying an artificial member and would, at the same time, in some states reduce the compensation of the injured employee.

Autopsies should be made at the request of the employer, the beneficiaries, or the state board, and should be paid for by the party requesting them;

Compensation for disease alleged to be due to accident should be granted only on proof of direct causal connection between the accident and the onset of the disease;

Compensation for the aggravation of latent or pre-existing disease should be limited to the degree of disability caused by the aggravation;

The per cent of reduction of vision and its economic valuation should be based on the age and occupation of the employee, and each case should be judged on its merits and not by a predetermined schedule;

Claims that hernia has been caused by employment must be made within twenty-four hours of its alleged occurrence and must be supported by proof of certain specified conditions;

Compensation should be granted for occupational diseases that are peculiar to the employment or are due to some unexpected result thereof. The term "and sequelae" frequently used in connection with occupational disease schedules, should be eliminated.

These provisions are not new departures, since everyone of them may be found in the compensation laws of one or more of the states; but, the Conference Board points out, their substantial inclusion in all the state laws would obviate much of the confusion and difficulty now experienced in the administration of these laws.

New Home of Norfolk County Medical Society.

For some years past the Norfolk County Medical Society, which has a membership of some 180 physicians of Norfolk, Portsmouth and Norfolk County, has been very inadequately housed in a small hall in a down town building where light and air were markedly absent. The windows of the hall opened on a five foot passage between two tall buildings, and even with the brightest sunlight outside artificial light had to be used, and adequate ventilation was impossible. For a long time the members have annually debated the question of more satisfactory quarters; but, for outstanding reasons, until very recently no suitable place could be found.

With the erection and equipment of the new Medical Arts Building, an opportunity came for the long sought improvement. An arrangement was made with the owners of the building, which was planned as an eight story office building, to add a half story and make this ninth floor the home of the Medical Society. This plan was carried out and, on the 1st of January, possession was taken of the new quarters. According to the plan, this part of the building is set back some distance from the edge of the roof of the main building, so that in summer time a very attractive roof garden may be arranged, which will command a view of surpassing beauty of the splendid harbor of Norfolk and surrounding territory. A division into two rooms has been made, the larger providing a commodious assembly room of approximately double the size of the old

one, and the smaller is a cozy reading room giving space for a portion of the Society's valuable library, the rest of which occupies space in the assembly room. Both rooms have ample provision for light and ventilation and have been fitted with many conveniences for the comfort and utility of the membership.

For three years past the Society has employed a full time Librarian and the library is accessible daily for the use of its excellent stores of information, and its use by the members is steadily on the increase. The unflagging zeal of Dr. Frank Hancock as Chairman of the Library Committee, supported by active associates, is fast building up a library of real value, helping to make the activities of the Society a large factor in the professional lives of its membership. In no small degree has this feature of the work made possible the presentation by the Society of helpful, progressive enthusiasm that has characterized the programs of the past few years. Meetings are held each Monday of the year except during the heat of summer, and the numbers in attendance and interested discussions attest the high character of the papers presented and the degree to which the Society has succeeded in impressing its intrinsic value upon the minds of its members. That it has fostered a fraternal spirit among the physicians who frequent its meetings is one of its greatest achievements. Seldom is so great a degree of harmony exhibited as among the members of the profession in Norfolk. That a yet wider field of usefulness is opening before the Society, and that its progress will greatly outstrip that of the past go without debate.

The Tri-State Association of the Carolinas and Virginia.

Is to hold its annual meeting in Richmond, Va., February 18, 19 and 20. The first session will convene at the Jefferson Hotel, at 10 A. M., on the 18th, Dr. F. H. McLeod, of Florence, S. C., presiding. The meeting is to be purely scientific. On Wednesday, the 18th, at 6:30, the alumni of the Medical College of Virginia will have a banquet at Commonwealth Club and, at the same time, all ex-presidents attending will have the usual presidential dinner. Dr. James K. Hall, Westbrook Sanatorium, Richmond, is secretary-treasurer, and will gladly give any further information about this meeting.

The Virginia-West Virginia Section, Clinical Congress of American College of Surgeons

Will hold its next meeting in Charleston, W. Va., March 20 and 21. Dr. Clarence Porter Jones, Newport News, is chairman, Dr. J. E. Rawls, Suffolk, secretary, and Dr. Hugh H. Trout, Roanoke, counselor, of the Virginia section. Dr. G. G. Schoolfield, Charleston, is chairman, Dr. J. E. Cannaday, Charleston, secretary, and Dr. Hugh G. Nicholson, Charleston, counselor, of the West Virginia section.

Married.

Dr. O. C Page and Miss Nettie Clements, both of Brodnax, Va., January 18.

Lemuel Redmond Broome, Kinston, N. C., a member of the graduating class of the Medical Department of the University of Virginia, and Miss Dorthy Dawson Houchens, of Charlottesville, Va., January 20. Mrs. Broome recently graduated from the training school of the University Hospital.

Dr. John M. G. Ryland and Miss Virginia Randolph Davis, both of Richmond, January 27.

Dr. Charles E. Dyer,

Jewell Ridge, Va., recently spent several days visiting his family in Pulaski, Va.

To Make Serums the Same the World Over.

The Health Committee of the League of Nations, in a report to be filed with the Council of the League, a copy of which has just reached this country, announces the plans of the Committee for the standardization of antitoxins and serums. Last year agreement was reached on the question of the standardization of antitoxin for diphtheria and it is expected that during the present year the tetanus serum will be standarized. Similar attempts for the standardization of serums are being carried on in other branches of practical medicine, notably with regard to the use of insulin.

The value of the standardization of serums and antitoxin to physicians lies in the fact that in the future the medical authorities of different nations will have at their disposal the medical knowledge, practice, and literature of all countries. In the past the hospital statistics of London, Berlin and Paris have been of little use to the American practitioner as every country has a different kind of serum.

Dr. O. S. Burns,

Lebanon, Va., had the misfortune to have his car damaged recently by a speed demon, while en route to Bristol, Va. The doctor and his wife fortunately escaped without injury.

Dr. and Mrs. R. T. McNair

Have returned to their home at Emporia, Va., after a visit to Philadelphia and other northern cities.

Dr. Lewis M. Allen,

Winchester, Va., has been named a member of the executive commitee of the Clarke County Horse and Colt Show Association.

Dr. Dean B. Cole,

Richmond, has been appointed head of the Tuberculosis Division of the Bureau of Health of this city. He formerly held this position but resigned on account of his health. The place has been vacant since the resignation of Dr. W. Nelson Mercer, last summer.

Dr. Cole will be a part time officer but he will have general supervision of tuberculosis work in this city and be chief medical officer of Pine Camp hospital.

This will in no way interfere with Dr. Cole's private work.

Education Pays.

$33,000 is the cash value of a four-year high school course, and $72,000 the cash value of college or technical training, according to a recent study by Dean Everett W. Lord, of the College of Business Administration of Boston University. Dean Lord has issued charts showing the maximum earnings of the average untrained man, as compared with those of the high school graduate and of the college or technical school graduate. The untrained man, he finds, begins work at fourteen, reaches his maximum income at thirty, receiving on the average less than $1,200 a year, and has earned by the time he is sixty, about $45,000. During the four years that would have given him a high school education, he earns not more than $2,000.

The high school graduate goes to work at eighteen, rises to a maximum income of $2,200 a year at forty, and has earned by the time he is sixty, about $78,000. By remaining four years in high school, at an immediate loss of $2,000 in earnings, he has increased his total earnings by $33,000.

The college or technical school graduate begins work at twenty-two, rises to a maximum of $6,000 at sixty, and earns in all about $150,000.

Gift Made Indiana University for Women's Hospital.

A gift of $250,000 has been made to the Indiana University by Mr. and Mrs. William H. Coleman, of Indianapolis, for a woman's hospital, to be used principally for lying-in patients. The new hospital will be located on the medical school campus, at Indianapolis, and will become a training unit of the school of medicine. It will have a capacity of about 100 beds, chiefly for lying-in cases and a smaller number of gynecological patients, and will include the very latest special equipment. It will be maintained by the state and will receive patients from every county in the state.

This gift from Mr. and Mrs. Coleman is in addition to one of $75,000 contributed by them last June to the school of medicine of the state university, for the endowment of three chairs—ophthalmology under the direction of Dr. F. A. Morrison, surgery directed by Dr. John H. Oliver, and gynecology under Dr. O. G. Pfaff. Both gifts are in the form of a memorial to their daughter.

Hanover County Board of Health.

Dr. J. A. Wright, of Doswell, Va., has been named secretary of the Hanover County Board of Health, succeeding the late Dr. H. B. Anderson, of Noel. Dr. A. Chambers Ray, of Ashland, is chairman of the board, and Dr. Wright and Dr. A. B. Gravatt, of Ellerson, represent two districts.

Dr. R. C. Fravel,

Richmond, recently visited his mother and brother at Woodstock, Va.

Dr. W. C. Webb,

Disputanta, Va., was elected president of the County Council of Prince George, at the organization held at Prince George Courthouse, January 21.

Dr. Thurston Turner,

A recent graduate in medicine from a Louisville, Ky., school, has located at Swords Creek, Va., for the practice of his profession.

Winners of Modern Hospital's Essay Contest Announced.

Mr. Edward A. Fitzpatrick, dean of the graduate college and educational director of the hospital college of Marquette University, Milwaukee, Wis., received first prize in *The Modern Hospital* Publishing Company's essay contest on "The Interrelationships of Hospital and Community," which closed November 1. Three awards of $350, $150, and $100, and three honorable mentions were made.

Second and third prizes went to Dr. Lucius R. Wilson, assistant superintendent, Barnes Hospital, St. Louis, Mo., and to Dr. D. L.

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Richardson, superintendent, Providence City Hospital, Providence, R. I., respectively.

Honorable mention was given to Mr. John R. Howard, Jr., superintendent, New York Nursery and Child's Hospital, New York; Mr. H. J. Southmayd, assistant superintendent, Mount Sinai Hospital, Cleveland, Ohio; and Miss Zella Nicolas, R. N., a graduate of the nursing school, Mount Sinai Hospital, New York, N. Y., now a student at Teacher's College, Columbia University, N. Y.

Dr. G. G. Painter,

Of Pulaski, Va., has been critically ill with pneumonia.

Dr. Charles M. Caravati,

Richmond, gave a talk on "Recent Advancements in Medicine" before the Catholic Business and Professional Women's class in current events, January 29.

Dr. E. L. Grubbs,

Front Royal, Va., was a recent visitor in Washington, D. C.

Dr. R. L. Mason,

Of Roanoke, Va., was called to Bridgewater, Va., on account of the death of his mother, which occurred at that place, January 18, 1925.

Dr. Frank Hopkins,

Of Hot Springs, Va., left the first part of January for a sea trip to Los Angeles, California, via Panama Canal, and expected to be away about six weeks.

Dr. Charles A. Easley,

After many years of practice at Bluefield, W. Va., because of illness of several years' duration in the mountains, moved to Chatham, Va. He states that the climate there has restored his health and he is actively engaged in practice.

Dr. Lanier D. Pole,

Of Hot Springs, Va., visited the Mayo Clinic, Rochester, Minn., in December.

Dr. J. Minor Holloway,

Of the Graduate School of Medicine, University of Pennsylvania, Philadelphia, spent the Christmas holidays with his family in Port Royal, Va.

The Virginia Tuberculosis Association,

At its meeting in Richmond, in January, re-elected Dr. Charles R. Grandy, Norfolk, president for the following year. Dr. E. C. Levy, Richmond, was elected first vice-president, and Dr. Roy K. Flannagan, Richmond, secretary. Drs. Grandy, E. C. Levy, William F. Drewry, and B. B. Bagby are among the members of the executive committee.

Dr. and Mrs. George C. Hall,

Richmond, left the latter part of January for Florida, where they will spend several weeks while Dr. Hall is recuperating from a recent illness.

Dr. Julian M. Robinson,

Danville, Va., is at work again, after undergoing an operation in January, for the removal of his tonsils.

Dr. and Mrs. Charles C. Tennant,

Charlottesville, Va., after a short visit to Richmond, have sailed for a tour of European countries, including France, Italy, Germany, Scotland, and Ireland.

Radio Service Far Reaching in Health Work.

For three years, the U. S. Public Health has operated a Health Information by radio service consisting of weekly health lectures on timely health topics. A total of forty-seven stations are now co-operating in this work. Surgeon-General Cumming was agreeably surprised, recently, to receive a letter from the chairman of the Health Week Committee of Jerusalem, Palestine, which stated that during their health campaign, several of our health talks prepared for broadcasting were used.

Dr. Bertha D. Berger,

Who was for sixteen years assistant physician at the Western State Hospital, Staunton, Va., is now resident physician at the Grundy Sanitarium, Catonsville, Md.

Dr. William H. Higgins,

Richmond, was elected secretary-treasurer of the local chapter of the Kappa Alpha fraternity, at its annual meeting in January.

Professor of Preventive Medicine at Medical College of Virginia.

Dr. E. C. Levy, former director of the Richmond Department of Public Welfare, has accepted the professorship of preventive medicine at the Medical College of Virginia, and entered upon his duties at the beginning of the second semester on January 27.

Dr. W. G. Trow,

Warrenton, Va., has been under treatment at Walter Reed General Hospital, Washington, D. C., for several weeks.

Birth Registration in North Dakota.

North Dakota, having improved its birth registration so that it is now ninety per cent complete, has been admitted to the birth-regis-

tration area of the United States. This area now includes thirty-two states and the District of Columbia.

Infant Mortality Decreases in Germany.

A decrease in infant mortality in Germany during the past five years, as compared with the pre-war period, is reported by the *Soziale Praxis*, Berlin. The rate has dropped from 150 per 1,000 live birth in 1913 to 132 in 1923. As compared with the United States rate for 1923, which was seventy-seven, Germany's rate is still very high.

Specialists of all Nations Will Continue to Fight Cancer.

A Commission to study Cancer to consist of international medical authorities has been appointed by the Health Committee of the League of Nations. The first work of the Commission will be a comparison of the statistics of Great Britain, Italy and the Netherlands relating to the cause of the difference shown to exist between the cancer mortality of these countries. The Cancer Commission was further empowered to extend its investigations into the epidemiology of cancer in general as far as circumstances will permit.

So far European medical authorities have discovered that there is more cancer in England than in Italy and that there seems to be an inverse relation between cancer and birth rate. This hypothesis seems to be borne out by the fact that in the United States women of Italian birth, according to Dr. Eichel, have more children and less cancer than women from the British Isles.

The services of Dr. Eichel, of New York, were loaned to the Health Committee of the League by the State of New York. He died from double pneumonia in Geneva on December 23, 1924.

Vice-President Weicker, of E. R. Squibb and Sons, Honored.

Fellow executives, department heads and representatives of the sales staff of E. R. Squibb & Sons, on January 3rd, at the Hotel Commodore, New York, participated in the celebration of the twentieth anniversary of the association of Vice-President Theodore Weicker with the House of Squibb. The feature of the happy event was the presentation to Mr. Weicker by President Carleton H. Palmer, on behalf of those present, of a rock-crystal service set with a center piece of old English spode ware. Although taken by surprise, Mr. Weicker, who had already addressed the members of the Squibb Go-Getter Club, who had contributed the most consistent and constructive service during the year past, was quite equal to the new demand. His graceful response was another convincing demonstration of the genuine inspiration and kindly consideration he has extended to his co-workers throughout the years that he has sturdily maintained the sterling principles of the House of Squibb as established by its illustrious founder, Dr. Edward R. Squibb.

The presentation of rewards to the fifteen representatives of the sales staff who had qualified as the key Squibb Go-Getters during 1924 was another interesting feature of the program. R. D. Keim, director and general sales manager, acted as toastmaster at the banquet and presided at the reception which followed.

Dr. P. D. Lipscomb,

Richmond, has again been elected surgeon of the Stonewall Jackson Camp, Sons of Confederate Veterans.

Germ Killing Effect of Ultra-Violet Measured.

A study of the germ killing action of the ultra-violet rays has been made by the Bureau of Standards, Department of Commerce, covering the range of wave length from just beyond the range of the visible spectrum down to the shortest wave lengths emitted by a mercury vapor arc in a quartz lamp. These tests are reported in scientific paper No. 495 of the Bureau entitled "A Radiometric Investigation of the Germicidal Action of Ultra-Violet Radiation" by W. W. Coblentz and H. R. Fulton. Copies may be obtained from the Superintendent of Documents, Government Printing Office, Washington, D. C., at the price of 20 cents each.

Dr. Henry J. Langston,

Danville, Va., announces removal of his office to suite 509-11 Masonic Temple, that city, where he will continue his work in general practice.

Dr. and Mrs. Powhatan Morcure,

Bealeton, Va., are spending the winter months with their son in Washington, D. C.

U. S. Civil Service Examinations.

The U. S. Civil Service Commission, Washington, D. C., announces the following open competitive examinations, information in regard to which may be obtained from the above named Service, or the secretary of the U. S.

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civil-service examiners at the post-office or customhouse in any city.

Junior medical officer, assistant medical officer, associate medical officer, medical officer, and senior medical officer, for various branches of the Government service, receipt of applications for these positions to close June 30.

Physiotherapy aide, physiotherapy pupil aide, and physiotherapy assistant, examinations to be held throughout the country on February 18, March 25, April 22, May 20, and June 24, 1925.

Occupational therapy aide, and occupational therapy pupil aide, applications for these positions to be rated as received until April 30.

Associate social economist, and assistant social economist, receipt of applications to close March 10.

Graduate nurse, graduate nurse (visiting duty), and dietitian, applications to be rated as received until June 30, 1925.

Dr. Chester E. Haberlin,

Of the '24 class, Medical College of Virginia, after a service of several months at Grace Hospital, New Haven, Conn., has located at 324 Carroll Avenue, Bridgeport, Conn.

Dr. and Mrs. William Patterson,

Richmond, Va., have just returned home after a vacation of several weeks in Miami, Fla.

Dr. A. I. Dodson,

Richmond, a former lieutenant in the navy, has been appointed a captain in the medical corps of the Virginia national guard and will be attached to the 246th coast artillery. He succeeds Dr. E. T. Trice, Richmond, recently promoted.

Dr. Eugene Rogers

Returned to his home in Covington, Va., the middle of January, after an extended visit to Chicago.

The Annual Congress on Medical Education, Medical Licensure, Public Health and Hospitals

Will be held in Congress Hotel, Chicago, March 9-12, inclusive. An interesting program includes many speakers of national prominence.

Dr. A. L. Jones,

Recently of Chilhowie, Va., announces his removal to Galax, Va.

Dr. T. W. Edmunds,

Danville, Va., as left for Vienna, Austria, where he will take six months' post-graduate work in diseases of the eye, ear, nose and throat. Dr. Edmunds, during his seventeen years in Danville, has limited his work to these specialties.

The Southern Section of the American Laryngological, Rhinological and Otological Society

Held its meeting in Jacksonville, Fla., January 19, under the presidency of Dr. H. M. Taylor of that city. Drs. E. G. Gill, Roanoke, Va., and H. S. Hedges, Charlottesville, Va., were among those present.

Dr. Thomas J. Tudor

Has moved from Exeter, Va., to Norton, Va., where he will continue the practice of his profession.

Dr. H. O. Bell,

Richmond, who has been medical inspector of the City Bureau of Health since December, 1923, will leave March 1st for New York City, where he will take post-graduate work in obstetrics at the New York Nursery and Child's Hospital. He will return to Virginia about September 1st.

Dr. J. S. Horsley, Jr.,

Has returned to his home at Westmoreland Place, Richmond, Va., after undergoing an operation for an ossified subperiosteal hematoma of the right femur, at Johns Hopkins Hospital, Baltimore, Md. This condition was the result of a foot ball injury received some years ago.

Dr. Alexander G. Brown, Jr.,

Richmond, after several weeks spent in pleasure and attending clinics in European countries, landed in New York on the 10th of February, and expected to be home by the middle of the month.

The American Congress on Internal Medicine

Will hold its ninth annual clinical session in Washington, D. C., March 9-14, 1925.

Washington clinicians and investigators of attainment will devote the entire session to amphitheatre and group clinics, ward "rounds," laboratory conferences, lectures, demonstrations of special apparatus and methods, and the exhibition of unusual scientific collections. Civilian and governmental services are united in the aim to make the week useful and memorable.

Practitioners and laboratory workers interested in the progress of scientific, clinical and research medicine are invited to take advantage of the opportunities afforded by this session.

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Dr. Wm. Gerry Morgan, Washington, D. C., is president. Address inquiries to the Secretary-General, Dr. Frank Smithies, 1002 North Dearborn Street, Chicago, Ill.

Bed Endowed at Winchester Hospital.

Memorial Hospital, Winchester, Va., has received a check for $5,000 from Graham F. Blandy, of New York and Clarke County, Va., to endow a bed in the hospital as a memorial to his mother. The interest will be used for the up-keep of the bed which is to be for the free use of any resident of Clarke County who may not be able financially to pay needed hospital charges.

New Building for Doctors in Washington.

A corporation, composed of Washington, D. C., physicians, with Dr. Charles S. White as president, and Dr. O. B. Hunter secretary, has let plans for the erection of a large office building in that city, which will be especially designed for offices of physicians and surgeons. It is to be located at 18th and I Streets, Northwest.

Eugenics in Relation to the New Family

Is the fourth of the "New Family" series of booklets issued by the Virginia Bureau of Vital Statistics. It is for popular circulation and may be had free upon request to the State Bureau of Vital Statistics, Richmond, Va. It refers briefly and in an elementary manner to the principles of eugenics, particularly with reference to the preservation of racial purity. It may well be placed in the hands of all young and marriageable persons in the State.

The Inter-State Post Graduate Clinic Tour of American Physicians,

To Canada, the British Isles and France, will start from Chicago, May 17, or from cities in the east in time to reach Toronto on May 18. Arrangements have been made for physicians to visit clinics in Toronto, Montreal, London, Liverpool, Manchester, Leeds, Dublin, Belfast, Glasgow, Edinburgh, Newcastle, and Paris, and Lyon and Strasbourg, if desired. During the stay in these various cities, time will be allowed for sight-seeing and some social functions. The clinics and demonstrations will include all the different branches and specialties of medical science. Dr. Charles H. Mayo, Rochester, Minn., is president, and Dr. William B. Peck, Freeport, Ill., director of the tour. The trip will last about six weeks. Price of the trip from Chicago, Ill., and return to Chicago, is from $750 to $990; from Montreal to Montreal or New York, on return, $640 to $880.

The tour is open to members of the profession who are in good standing in their state or provincial societies and to their families. A limited number of lay friends of physicians can be cared for. In order to reserve space for the tour, send $65 per person to the managing director, as reservations will be assigned and preference given for accommodations in the order received. This amount will be applied on the price of the tour, or, should the applicant be unable to go, the $65 will be refunded immediately, if request for same is made within six weeks of sailing time.

For further information, write Dr. William B. Peck, Freeport, Ill.

Dr. R. W. Stoneburner,

Montgomery, W. Va., recently spent sometime visiting friends in the neighborhood of his former home in Shenandoah County, Virginia.

Another Full-Time Secretary.

The West Virginia State Medical Association has appointed Mr. Sterrett Neale, of Huntington, W. Va., as executive secretary, and will have offices in Smallridge Building in Charleston. Mr. Neale has been engaged in newspaper work in Huntington and Charleston.

Dr. and Mrs. E. P. Tompkins,

Of Roanoke, Va., with their little sone, are spending the winter at Pass-a-Grille, an island in the Gulf of Mexico, near St. Petersburg, Fla.

Have You Seen a Copy of Hygeia?

If not, secure a copy from the American Medical Association, Chicago, Ill. It is the best journal pertaining to health matters which can be placed in the hands of your patients. One of our members is showing his appreciation of this magazine, devoted to "individual and community health," by trying to get it introduced into all the public schools in his community. Endorsement of this kind speaks for its value.

Dr. William T. Graham,

Richmond, was elected president of the Harvard Club of Virginia, at its annual meeting held in Richmond, the latter part of January.

Members of Committees, Richmond Chamber of Commerce.

The following doctors are among those named as members of various committees of the Richmond Chamber of Commerce for 1925:

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Drs. Paul V. Anderson, Charles A. Blanton, J. Shelton Horsley, J. Morrison Hutcheson, Clifton M. Miller, William H. Parker, Robert S. Preston, Charles R. Robins, and Carrington Williams.

American Association for Medical Progress.

The Friends of Medical Progress, a National Lay Organization incorporated in Boston, Massachusetts, in 1923, for the purpose of disseminating medical knowledge among the general public, is contemplating for the year 1925 a greatly extended program of service.

Office headquarters, formerly located in Boston, have moved to New York City, 370 Seventh Avenue, where co-operation with the more important educational and health organizations will be facilitated. With the change in location also comes a change in name. The society will hereafter be called the American Association for Medical Progress.

Mr. Benjamin C. Gruenberg, well known to workers in the fields of education and public health, will take over the active management of the organization.

In the past year approximately 72,000 publications dealing with various phases of animal experimentation, vaccination, etc., have been distributed. An increasing number of similar publications is planned for the current year. A lecture program will be developed and attention will be focused on the formation of branch organizations throughout the country.

Income Tax Time Here Again!

We publish this as a reminder to file your 1924 income tax returns with the collector of internal revenue for the district in which you live or have your principal place of business, on or before March 15, 1925. Failure to receive a form does not relieve the taxpayer from his obligation to file a return and pay the tax within the prescribed time. Forms may be obtained from offices of collectors of internal revenue and branch offices.

All single people who had a net income of $1,000 or more, or gross income of $5,000 or more, and married couples who had a net income of $2,500 or more, or gross income of $5,000 or more, must file returns.

Dr. William deB. MacNider,

Of Chapel Hill, N. C., delivered an address before the Richmond Academy of Medicine at its regular meeting in this city, January 27.

Dr. E. W. Young,

Petersburg, Va., was elected senior commander of the Old Dominion Post, No. 622, Veterans of Foreign Wars, at its regular meeting in Petersburg in January.

Gift to Crippled Children's Convalescent Hospital.

The Crippled Children's Convalescent Hospital, Richmond, has been the recipient of a gift of $10,000 from Mrs. Alfred I. Dupont, as a memorial to her mother. This will be used to build a heliotherapy room and a part will be put out at interest to furnish a perpetual endowment for the hospital.

Dr. Mosby G. Perrow,

Lynchburg, Va., has been elected one of the directors of the Lynchburg Inter-State Fair Association.

Addition to Elizabeth Buxton Hospital.

An addition has been started to Elizabeth Buxton Hospital, Newport News, Va., which will have three stories and a basement. The latest modern equipment will be installed in the several laboratories to be included in the extension, the entire cost of which will be about $110,000. It is thought the new wing will be completed about the end of the summer.

Doctors Among Bank Directors.

The following doctors are noted as directors in some of the Virginia banks: Dr. Wm. J. Crittenden, Orange; J. P. Hankins, Unionville; E. W. Twyman, Twymans Mill; Drs. J. M. Williams, Fletcher J. Wright, W. P. Hoy, and J. Bolling Jones, Petersburg; Dr. William D. Prince, Stony Creek; and Dr. J. F. Slade, Sussex.

New Dean at Northwestern University.

Dr. Irving S. Cutter, Omaha, Nebr., formerly editor of the *Nebraska State Medical Journal*, has been appointed dean of the medical school of Northwestern University, Chicago, and will enter upon his duties in the early summer.

Dr. S. A. Conduff,

Formerly of Laurel Fork, Va., has located at Mount Airy, N. C.

New York's New Medical Center.

Construction has been begun on the first and largest unit of New York's new Medical Center. Ground was officially broken on January 31st, on the twenty-two acre plot at 168th Street and Broadway. This center is to be composed of the new Columbia University School of Medicine and Presbyterian Hospital —a ten million dollar structure. One million dollars each has been contributed by the

Carnegie Foundation, the Rockefeller Foundation, and the General Education Board.

Appointments by President of Medical Society of Virginia.

Dr. Hunter McGuire, Winchester, president of the Medical Society of Virginia, has made the following appointments:

Military Committee of the Medical Society of Virginia: Dr. Garnett Nelson, Richmond, chairman, and Drs. B. B. Dutton, Winchester, B. R. Kennon, Norfolk, and J. T. McKinney, Roanoke.

Committee to make study of Industrial Insurance and make report at next annual meeting of the State Society: Dr. Israel Brown, Norfolk, Dr. James K. Hall and Dr. W. Lowndes Peple, Richmond; and

Dr. E. C. S. Taliaferro, Norfolk, chairman of the Walter Reed Memorial Association, succeeding Dr. Garnett Nelson, resigned.

Fire at University of Pennsylvania.

A loss estimated at $25,000 was caused by a fire which occurred in the Medical School of the University of Pennsylvania, the latter part of January. Six laboratories and a research room were badly wrecked by the fire.

Why Are Children Bad?

Delinquent children are usually under par physically. This is shown by a study made in New York of 743 children brought before the children's court. Examination of these children indicated that the physical condition of delinquent children in general is much inferior to that of ordinary school children. Seventy-nine per cent of the children before the court had physical defects, while only thirty-five per cent of public school children living in the same districts and of the same ages and nationalities, had defects. The chief difference between the two groups so far as physical conditions were concerned, seemed to be in nutritional and glandular disturbances.

Cleveland's Anti-Diphtheria Campaign.

An anti-diphtheria campaign among kindergarten and first-grade children in the Cleveland schools is described in the *Ohio State Medical Journal*. Only children who bring signed permits are given the treatment, which consists of the Schick test to discover whether susceptibility to diphtheria exists, and then, in cases showing positive reactions, injection of three doses of toxin-antitoxin. Two-thirds of the 12,000 children tested during the present year were found to give positive reactions. No untoward results and very few local reactions followed treatment.

A Child-Welfare Professorship.

Child welfare is now recognized as a subject worth the attention of colleges and universities. Evidence of this is seen in the fact that a chair of instruction in the welfare of the child has been endowed at the University of Pennsylvania.

Correcting Physical Defects in School Children.

Over 163,000 defects are reported to have been corrected as a result of the physical examination of New York City school children. The weekly bulletin of the New York Department of Health gives these figures and also reports that examination of children applying for employment certificates showed a decrease in the percentage of defects discovered during 1923 as compared with previous years.

England's Low Infant Death Rate.

According to the report of the Registrar General for the third quarter of 1924, the infant mortality rate in England and Wales during that quarter was the lowest ever recorded in those countries—fifty-four per one thousand live births. The United States rate in 1922 for the birth-registration area was seventy-six.

Obituary

Dr. Edward May Magruder,

A prominent physician of Charlottesville, Va., died at his home in that city, January 10, at the age of sixty-six years. He was born in Charlottesville, Va., and, upon completion of his academic education, studied medicine at Bellevue Hospital Medical College of New York and at the University of Virginia, graduating from the last named school in 1884. Following this, he took post-graduate work at the New York Polyclinic. Dr. Magruder joined the Medical Society of Virginia in 1885 and the same year became connected with the department of medicine at the University of Virginia. He was instructor there in physical diagnosis for twenty-five years, until he was forced by his health to retire from teaching. He was actively interested in the medical affairs of the State and was connected with a number of medical organizations. He was for a number of years a local surgeon of the Chespeake and Ohio and Southern railways. Dr. Magruder

served as a member of the medical advisory board of the twenty-ninth Virginia district during the World War. He is survived by his wife, who was Miss Mary Cole Gregory, of King William County, Va., and by four children.

Dr. Albert Sidney Priddy,

Superintendent of the Virginia Colony for Epileptics and Feebleminded since its establishment in 1910, and formerly assistant superintendent at the Southwestern State Hospital at Marion, died January 13, at a Lynchburg, Va., hospital. His death resulted from Hodgkin's disease. Dr. Priddy was born in Lunenburg County, Va., fifty-nine years ago and graduated in medicine from the College of Physicians and Surgeons of Baltimore in 1886. After graduation, he engaged in private practice in Keysville, Va., for about fifteen years before taking up institutional work. He had been a member of the Medical Society of Virginia since 1886 and was a former vice-president; he was also an interested member of several other medical societies and was recognizd as a psychiatrist of note. He served two terms in the House of Representatives from Charlotte County. Dr. Priddy is survived by his wife (having been married little more than a year), and by several sisters. The burial was at his old home at Keysville, Va.

Dr. Charles Allen Saunders,

A prominent and beloved member of the Norfolk profession, died November 17, 1924, after having been in bad health for some time. He was born in Emporia, Va., in 1886, and studied medicine at the University College of Medicine, Richmond, from which he graduated in 1899. He was elected to membership in the State Society the same year. For more than twenty-five years, Dr. Saunders had been one of the most regular attendants of the Norfolk County Medical Society and took an active part in its deliberations and activities. He continued active in his professional work until shortly before his death in spite of the fact that he was a constant sufferer. He was held in high esteem by his professional associates.

Dr. Allen Granberry Thurman,

Of Appomattox, Va., died January 31st at Memorial Hospital, Lynchburg, Va., after a short illness. He was forty-nine years of age and studied medicine at the University College of Medicine, Richmond, from which he graduated in 1900. He had been a member of the Medical Society of Virginia since 1903 and was a Mason. Dr. Thurman for some time practiced at Goodview, Va., having moved to Appomattox only a few years ago. The body was taken to Bedford County for burial. He is survived by his wife, four sons, a daughter and a large family connection.

Dr. Nelson Winslow Francis,

A graduate of the University College of Medicine, in 1897, died at his home at Ormond, Fla., December 23, after a long illness. He was fifty-one years of age.

Dr. Lewis Beall Firey

Died at his home in Norfolk, Va., January 1st, of influenza. He was fifty-nine years of age and a graduate in medicine from the University of Maryland, Baltimore, in 1890.

Colonel William Otway Owen, U. S. A.

Formerly of Virginia and a graduate in medicine from the University of Virginia in 1878, died at his home in Washington, D. C., December 26th, at the age of seventy years. Death was due to heart disease.

Dr. John Hunter,

Of Sydney, Australia, who with Dr. N. D. Royle came to America at the invitation of Dr. William J. Mayo and Dr. Franklin H. Martin to deliver the John B. Murphy Oration in Surgery at the meeting of the Clinical Congress of Surgeons, in New York, last October, died in London, England, December 10th. The work of Drs. Hunter and Royle in connection with Spastic Paralysis created unusual interest among the surgeons, orthopedists and neurologists of the world. Dr. Hunter had stopped in England on his return trip from America, and was engaged in giving demonstrations and lectures in connection with his work. In his enthusiasm over his work, he did not realize that he was seriously ill until a few days before his death.

Sir James Mackenzie,

Widely known for his studies on diseases of the heart, died January 28th, at the age of seventy-one years. He was a recognized leader in medicine and will long be remembered for his valuable contributions to medical literature on diseases of the heart. He had been the recipient of many professional honors.

Trendelenburg Dead.

Professor Friedrich Trendelenburg, for many years director of the surgical university clinic in Leipsig, died in Berlin, December 16, at the age of eighty years.